

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

IN RE PLATINUM AND PALLADIUM
ANTITRUST LITIGATION

Lead Case No. 14-cv-9391

Hon. Gregory H. Woods

**THIRD CONSOLIDATED
AMENDED CLASS ACTION
COMPLAINT**

JURY TRIAL DEMANDED

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Plaintiffs Norman Bailey, Thomas Galligher, Larry Hollin, KPFF Investment, Inc., and White Oak Fund LP (collectively, “Plaintiffs”), individually and on behalf of all those similarly situated, as defined below, bring this proposed class action and allege as follows:

PREAMBLE

1. On March 28, 2017, this Court issued an Opinion and Order, ECF 179 (“March 28 Order”) granting in part and denying in part motions to dismiss.¹ The March 28 Order also granted Plaintiffs’ leave to amend. Plaintiffs carefully examined the Court’s March 28 Order and this Third Amended Complaint responds to the Court’s concerns as follows:

Rulings From Court’s March 28 Order		Plaintiffs’ Responsive TAC Paragraphs	
Dismissed BASF Corporation, UBS AG and UBS Securities LLC for failure to state a claim.	Pages 99-104	Plaintiffs have not named these entities as Defendants. These entities are included in this Complaint as co-conspirators.	N/A
Dismissed The London Platinum and Palladium Fixing Company Ltd. (“LPPFC”) for lack of personal jurisdiction.	Pages 89-97	Plaintiffs have not named the LPPFC as a Defendant. LPPFC is included in this Complaint as a co-conspirator.	N/A
Dismissed Plaintiffs’ unjust enrichment claim (Claim Seven).	Pages 75-76	Plaintiffs have not re-pleaded this claim.	N/A
Dismissed Plaintiffs’ manipulative device claim to the extent it seeks recovery for “false reporting” under Rule 180.1(a)(4).	Pages 67-70	Plaintiffs have not re-pleaded this claim.	N/A
Dismissed Plaintiffs’ Rule 180.1 claims to the extent they	Pages 70-71	Plaintiffs have added allegations that limit recovery	¶¶285 to

¹ Plaintiffs respectfully reserve the right to appeal adverse rulings from the March 28 Order. Any changes to this complaint based on the March 28 Order are made without prejudice to Plaintiffs’ right to appeal such rulings at the appropriate time or seek reconsideration under appropriate circumstances. This includes the dismissal of certain claims and the dismissal of Defendants BASF Corporation, UBS AG, UBS Securities LLC, and The London Platinum and Palladium Fixing Company Ltd.

Rulings From Court's March 28 Order		Plaintiffs' Responsive TAC Paragraphs	
seek recovery for conduct pre-dating August 15, 2011.		to damages arising from violations of Rule 180.1 that post-date August 15, 2011.	289
Dismissed BASF Metals and ICBC Standard for lack of personal jurisdiction.	Pages 86-87	Plaintiffs have added additional allegations as to Defendants BASF Metals Limited and ICBC Standard Bank plc pertaining to their continuous presence in the U.S. and their suit-related conduct in the U.S. This includes strengthening allegations that BASF Metals Limited and ICBC Standard Bank plc's conduct was directed at the NYMEX in this District. This also includes adding allegations that at least some Fixing submissions were directed from New York and New Jersey and that information from the Fixing was disseminated to and traded on by traders in New York and New Jersey (including on the NYMEX).	¶¶14, 34 to 38, 43 to 46, 64, 68, 72, 190 to 191, 194, 202
Dismissal of antitrust claims for failure to satisfy "efficient enforcer" analysis under antitrust standing.	Pages 39-51	Plaintiffs have pleaded additional allegations pertaining to: (a) Exchange trading on NYMEX and, specifically, how there is no identifiable counterparty for such trading. Thus, Plaintiffs are the most efficient enforcers of the antitrust laws as to these trades.	¶¶80 to 81

Rulings From Court's March 28 Order		Plaintiffs' Responsive TAC Paragraphs	
		(b) The close relationship between the Fix and NYMEX futures prices and vice versa.	¶¶5, 14, 79 to 103, 134, 143
		(c) The Defendants' substantial market share in physical platinum and palladium as well as NYMEX platinum and palladium futures and options.	¶¶6, 38, 40, 42, 44, 64, 71, 73, 77, 191, 194, 199
		(d) The fact that NYMEX is the leading centralized exchange for trading platinum and palladium futures and options.	¶¶4, 79, 89
		(e) Plaintiffs' ability to assess damages through discovery.	¶241
		Plaintiffs have also substantially narrowed the Class and scope of transactions covered by the Class definition.	¶265

2. Plaintiffs have made edits throughout the complaint to maintain consistency and to reflect updates due to the passage of time. Additionally, Plaintiffs have numbered the 86 charts used in this Complaint for ease of reference. Plaintiffs also removed one plaintiff (Ken Peters) who did not trade platinum and palladium in his individual name, but only did so through a corporate entity (KPFF Investment, Inc.). Finally, Plaintiffs reviewed each of the charts and their associated data resulting in modifications to five charts to correct the following:

- a. Correcting the scale of the Y-axis on Charts 30 & 31 (Normalized Average Spot

Prices Per Minute);

b. Correcting Charts 32 & 34 (Percentage of Days with the Greatest Drop in Spot Price) because palladium data for 2010 was double-counted resulting in some of the findings for palladium in these two charts to be overstated; and

c. Correcting Chart 72 (Comparison of Asset Price Movements) so that the entry “Platinum Spot – 8:20am to 8:25am EST” reads “Platinum Futures – 8:20am to 8:25am EST” and entry “Palladium Spot – 8:30am to 8:35 am EST” reads “Palladium Futures – 8:20am to 8:25am EST”; revised Chart 72 now includes both Platinum and Palladium Spot and Futures at these times, which, in any event, all have very similar results (all between 45.9% and 47.6%).

NATURE OF THE ACTION

3. Throughout the Class Period (as defined below), Defendants BASF, Goldman Sachs, HSBC, and Standard Bank met via private conference call twice each London business day for what was aptly known as the London Platinum and Palladium Price Fixing (the “Fixing” or “Fix”). The Fixing set global benchmark prices for platinum and palladium. The morning call was known as the “AM Fixing,” and the afternoon call was known as the “PM Fixing.” In 2004, the Defendants established The London Platinum and Palladium Fixing Company Ltd. (“LPPFC”) to operate as the vehicle for the Fixing.

4. The Fixing was supposed to be a competitive process. The process began with the current spot rate² for platinum and palladium. From that starting point, a *bona fide* auction was supposed to take place. In theory the equilibrium price for platinum and the equilibrium price for palladium reached during each auction – *i.e.*, the price where the Defendants’ buy and sell orders were roughly equal – became the “Fix” or the globally accepted benchmark prices

² The spot rate reflects the value of an asset at the moment of the quote.

adopted at that session of the Fixing for each metal. These benchmark prices would be used to set prices for transactions related to platinum and palladium worldwide including physical transactions and futures and options traded on the New York Mercantile Exchange (“NYMEX”), the leading venue for platinum and palladium futures and options trading, which is headquartered in New York, New York.³

5. Some buyers and sellers of physical platinum and palladium pre-arrange transactions with the price term being directly fulfilled by adoption of the Fix benchmark prices for a given future date, but the influence of the Fixing for platinum and palladium goes beyond contracts that explicitly adopt the Fix prices as their own. Because of the Fixing’s importance as a benchmark, as the Fix prices move, so too do the prices for physical platinum and palladium and NYMEX platinum and palladium futures and options (together, “Physical and NYMEX Platinum and Palladium”), both in terms of magnitude and direction. That is, when prices of physical platinum and palladium decrease \$1, as a general matter so do NYMEX platinum and palladium futures contracts. The near perfect correlation between the prices of physical platinum and palladium to NYMEX platinum and palladium contracts is thoroughly documented by studies conducted by independent academics and Plaintiffs.

6. Due to the fact that (1) the Fixing served as a benchmark for platinum and palladium and related investments, such as Physical and NYMEX Platinum and Palladium, and (2) the Defendants each have substantial market shares in Physical and NYMEX Platinum and Palladium, the conspiracy gave the Defendants the opportunity to move the Fixing downward at

³ The NYMEX is a commodities futures exchange owned and operated by CME Group Inc. (“CME”). CME stands for Chicago Mercantile Exchange. CME owns and operates large derivative and futures exchanges in New York and Chicago, as well as online trading platforms. CME’s two principal divisions in New York are NYMEX and Commodity Exchange, Inc. (“COMEX”).

their discretion to benefit themselves in a multitude of ways. Due to the fact that the Fix price was in a symbiotic relationship with Physical and NYMEX Platinum and Palladium prices, control over the Fixing gave the Defendants the ability to cash in on their foreknowledge and control of the Fix.

7. The Defendants also faced an enormous conflict of interest in participating in the Fixing. Each of the Defendants is a major participant in Physical and NYMEX Platinum and Palladium (including holding large proprietary positions, *i.e.*, trading for the Defendants' own financial gain). Shockingly, despite this enormous conflict of interest, Defendants and their co-conspirators benefitted from the fact that the Fixing had little or no government or independent oversight during the Class Period.

8. Thus, because the anachronistic Fixing process had sanctioned the Defendants' *daily, private, and unregulated* Fix meetings to set benchmark prices for platinum and palladium via the LPPFC, the Defendants were presented with a too-tempting opportunity for coordination. And, as with other benchmark prices (numerous interest rates, numerous FX rates, etc.), rather than letting prices move in line with competition, the Defendants colluded around the AM and PM Fixings for platinum and palladium to ensure prices moved in the direction that was financially beneficial to the Defendants' collective and individual interests.

9. That competitive forces broke around the AM and PM Fixings is confirmed by Plaintiffs' forensic work. As detailed herein, prices for platinum and palladium acted differently around the Fixing than they did *at any other time of day*. No matter how many ways the pricing data is analyzed, *statistically significant* patterns of deviations from the norm are observed, *only* around the AM and PM Fixing. Specifically, prices quickly went down far more often than they went up. And when prices went down at the Fixing, they went down *further* than prices

increased when they went up.

10. Defendants drove these downward movements first by moving Physical and NYMEX Platinum and Palladium prices in advance of and even during the Fixing. Based on the analysis conducted by Plaintiffs, the only credible explanation for the observed price movements is that Defendants shared in advance confidential client order information and information concerning their proprietary positions. This allowed the coordinated execution of transactions before, during, and after the Fixing. Transactions that would move the market in the desired direction – such as large sell orders on a day platinum and/or palladium were to be driven down – would be grouped and timed for maximum effect around the Fixing, thus altering the starting price, inducing clients to change their directions to the Defendants, and giving cover to an auction-rate that would otherwise have stood out. Transactions that would otherwise counteract those deals would be “netted off” between the Defendants and their co-conspirators, or otherwise executed (or not) in ways that did not send signals to the market that the Defendants did not want sent.⁴

11. Independent academic research confirms that the downward movements around the AM and PM Fixing were the result of manipulation and not natural market forces. In a fully competitive environment, over a long enough time horizon, there is no reason to expect *so much* more “bad” news to come out around the Fixing, than “good” news, as to have caused such

⁴ Defendants’ manipulative tactics included, among others, “front running” (trading in their own positions in advance of customer orders to take advantage of the market’s resulting move when the client’s orders are placed), “spoofing” (placing large orders that are never executed), “wash sales” (placing large orders that are executed then quickly reversed), and “jamming” (using such techniques to trigger a stop-loss order or to avoid a bank’s having to pay on an option or similar contracts). Significantly, these are the same techniques Defendant HSBC employed to manipulate the foreign exchange markets which are well-documented in its settlements with the U.S. Commodity Futures Trading Commission (“CFTC”) and other regulators. The overlap in manipulative strategy is not surprising. At least Defendant HSBC traded precious metals from its foreign exchange desk during the Class Period.

asymmetrical price movements at the Fixing. Nor is there reason for sellers to be *asymmetrically* drawn to the AM and PM Fixing, as opposed to buyers as well. Thus, that prices moved asymmetrically in one direction, in a statistically significant way, is powerful evidence that prices were being manipulated by the Defendants and their co-conspirators.⁵ So too is the fact that many of the anomalies – which previously appeared *consistently, year after year* – abated starting in 2014, just as the Fixing practices began to come under increased scrutiny and the Defendants’ scaled back their platinum and palladium short positions.

12. The manipulation was a joint effort of these Defendants – who are among the largest traders in Physical and NYMEX Platinum and Palladium. A single actor could not and would not have attempted to move the market so *consistently* over such a long time period. There would not have been enough “ammo” to do so, and the risk (and cost) would have been too high. Indeed, Plaintiffs’ analysis confirms that the downward movements were the result of *joint* actions by *these* Defendants.

13. The Defendants coordinated these efforts around the AM and PM Fixings, as opposed to other times of day, because the Fixing presented multiple advantages. The Fixing process and the creation of LPPFC provided a veneer of legitimacy for the Defendants’ *daily, private, and unregulated* meetings to set prices – something that would be an obvious anathema to competition in any other context. The Defendants were presented with a ready-made process for *daily* coordination of their activities. By manipulating the price around the Fixing, the Defendants were creating opportunities to profit in, among other places, Physical and NYMEX Platinum and Palladium.

⁵ Indeed, the price spikes are observed to have occurred around the AM and PM Fixing *specifically*. For various reasons, such as changing daylight savings times, the Fix occurred at different times during the New York trading day, and sometimes did not occur at all. The spikes follow the Fix and they disappear on days when no Fixing occurred.

14. The manipulation also had a direct and purposeful effect on Physical and NYMEX Platinum and Palladium prices. The Fix prices moved the value of, and determined the cash flow for, many different kinds of transactions including Physical and NYMEX Platinum and Palladium. The number of ways the world's largest precious metals banks and institutions could profit from foreknowledge as to the timing and direction of future spikes in the prices of platinum and palladium is essentially limitless. The Defendants profited on Fix price linked sales of physical platinum and palladium, allowing them to buy platinum and palladium cheaper during a period of artificial suppression than they otherwise would have, making a *riskless* profit when the immediate effects of the suppression abated (or, in the case of Defendant BASF, utilizing the physical platinum and palladium for commercial uses and realizing increased profits due to lower platinum and palladium costs). The Defendants profited because they were holders of massive short positions in NYMEX platinum and palladium futures and options, and otherwise actively traded NYMEX platinum and palladium futures and options including during the Fixing.

15. These are but some examples. There are many ways the Defendants could and *did* cash in on the foreknowledge that the Fix price, and thus the prices of platinum and palladium generally, was going to go down on a given day, at a given time. Large platinum and palladium traders like the Defendants could easily profit off of advance knowledge of the existence and timing of a downward price spike, *regardless* of their overall position at the start of the day.

16. The opportunity for profit from foreknowledge of a spike is made all the more clear by the fact that, while the prices of platinum and palladium move together with many of their related investments, the value that movement creates (or destroys) is not necessarily equal

even in a balanced portfolio.

17. For instance, NYMEX futures – an instrument the Defendants were heavily short in – are margined, on a cash basis, daily. In contrast, simply holding platinum and palladium in a vault does not result in a change in cash flows, and, indeed, a spike downward in the price of platinum and/or palladium could allow *more* platinum and/or palladium to be purchased, to be held for sale once the immediate impact of the suppression abated. By way of another example, platinum and palladium futures are only settled on expiry. Cash in hand today (from a daily-managed NYMEX futures contract) is generally worth more than an offsetting amount of cash leaving later (by way of a payment only at expiry forward). The Defendants – with their huge, daily-margined NYMEX short futures – were highly motivated to push the prices of platinum and palladium down on a daily basis, *regardless* of whether their positions were balanced from a regulatory or other perspective due to ownership of long positions such as physical platinum and palladium or forward contracts.

18. That the Defendants knew how to profit from the joint manipulation of financial benchmarks, despite any purported differences in interests between and amongst them on a given day, is confirmed by the fact this is just one in a series of such misbehaviors. Many of the world's leading banks have *admitted* to manipulating the key LIBOR financial benchmark, including by way of collusion between their respective traders. In the FX markets, many of the world's leading banks *admitted* that their traders colluded to move the markets in advance of the setting of key currency benchmarks.

19. And that similar manipulation was occurring concerning precious metals fixings is not mere speculation. In related cases concerning gold and silver, publicly available documents show that traders employed by the defendants and proposed defendants in those cases

(including Defendants HSBC and Standard Bank here) were in near constant communication concerning precious metals, precious metals fixings, physical precious metals trades, precious metals futures and options trades on the NYMEX, and more.⁶ These documents also show that the banks entrusted with the precious metals fixing process were engaging in manipulative and improper tactics including, but not limited to, front running, spoofing, jamming, sharing confidential information, and coordinating their trading.

20. Government investigations into manipulation of the precious metals fixings are ongoing. Both the U.S. Department of Justice (“DOJ”) and the CFTC are currently investigating at least 10 banks, including Defendants Goldman Sachs, HSBC, and Standard Bank.⁷ Indeed, the DOJ has intervened and, after various *ex parte* presentations, received a limited stay of discovery in the related gold and silver cases in this District due to overlap with the DOJ’s ongoing investigation.⁸ However, these government investigations, as well as others described below, have not yet resulted in substantial fines or penalties being assessed against Defendants or recovery for victims of the manipulation discussed herein.

21. On July 31, 2014, the LPPFC announced that it was seeking an independent third party to assume responsibility for the platinum and palladium Fixing process. On October 16, 2014, the LPPFC announced that the London Metal Exchange (“LME”) had been selected to become the new administrator of the platinum and palladium Fixing process. On December 1,

⁶ See, e.g., [Proposed] Third Consolidated Amended Class Action Complaint, *In re Commodity Exchange, Inc., Gold Futures and Options Trading Litig.*, No. 14-md-2548, ECF 183 (filed Dec. 6, 2016); [Proposed] Third Consolidated Amended Class Action Complaint, *In re London Silver Fixing, Ltd., Antitrust Litig.*, No. 14-md-2573, ECF 180 (filed Dec. 7, 2016).

⁷ Jean Eaglesham and Christopher Matthews, *Big Banks Face Scrutiny Over Pricing of Metals*, The Wall Street Journal (Feb. 23, 2015), available at <http://www.wsj.com/articles/big-banks-face-scrutiny-over-pricing-of-metals-1424744801>.

⁸ See, e.g., *In re Commodity Exchange, Inc., Gold Futures and Options Trading Litig.*, No. 14-md-2548, ECF 205 & 206 (S.D.N.Y. Jan. 13, 2017); *In re London Silver Fixing, Ltd., Antitrust Litig.*, No. 14-md-2573, ECF 200 & 201 (S.D.N.Y. Jan. 13, 2017).

2014, LME launched a new electronic Fixing system called LMEbuillion and the traditional platinum and palladium Fixing process ceased.

22. But none of these changes have compensated individuals and entities that traded Physical and NYMEX Platinum and Palladium, like Plaintiffs, who were injured in their business and property by Defendants' collusive and manipulative conduct. Plaintiffs seek redress in this action on their own behalf and on behalf of the proposed Class.

JURISDICTION AND VENUE

23. This Court has subject matter jurisdiction over this action pursuant to Sections 4 and 16 of the Clayton Act (15 U.S.C. §§ 15(a) and 26), Section 22 of the Commodity Exchange Act (7 U.S.C. § 25), and pursuant to 28 U.S.C. §§ 1331 and 1337(a).

24. Venue is proper in this District pursuant to 15 U.S.C. §§ 15(a), 22 and 28 U.S.C. § 1391(b), (c), (d) because during the Class Period all Defendants resided, transacted business, were found, or had agents in this District; a substantial part of the events or omissions giving rise to these claims occurred in this District; and a substantial portion of the affected interstate trade and commerce discussed herein has been carried out in this District.

25. The NYMEX, where much of the affected trading takes place and whose prices were manipulated, is located in the Southern District of New York.

26. This Court has personal jurisdiction over each Defendant, because each Defendant: transacted business throughout the U.S., including in this District and on the NYMEX; had substantial contacts with the U.S., including in this District and on the NYMEX; and/or committed overt acts in furtherance of their illegal scheme and conspiracy in the U.S. and on the NYMEX. In addition, the conspiracy was directed at, and had the intended effect of, causing injury to persons residing in, located in, or doing business throughout the U.S., including in this District and on the NYMEX, and Plaintiffs' claims arise out of Defendants' conduct.

27. The activities of Defendants and their co-conspirators were within the flow of, were intended to, and did have a substantial effect on the foreign and interstate commerce of the U.S.

THE PARTIES

A. Plaintiffs

28. Plaintiff **Norman Bailey** is an individual residing in Ontario, Canada. During the Class Period, Mr. Bailey sold NYMEX platinum and palladium futures contracts at artificial prices proximately caused by Defendants' unlawful manipulation as alleged herein. Mr. Bailey was deprived of transacting in a lawful, non-manipulated, competitive market for Physical and NYMEX Platinum and Palladium and otherwise suffered injury to his business or property as a direct and proximate result of Defendants' unlawful conduct.

29. Plaintiff **Thomas Galligher** is an individual residing in Phoenixville, Pennsylvania. During the Class Period, Mr. Galligher sold NYMEX platinum futures contracts at artificial prices proximately caused by Defendants' unlawful manipulation as alleged herein. Mr. Galligher was deprived of transacting in a lawful, non-manipulated, competitive market for Physical and NYMEX Platinum and Palladium and otherwise suffered injury to his business or property as a direct and proximate result of Defendants' unlawful conduct.

30. Plaintiff **Larry Hollin** is an individual residing in Bala Cynwyd, Pennsylvania. During the Class Period, Mr. Hollin sold NYMEX platinum and palladium futures contracts at artificial prices proximately caused by Defendants' unlawful manipulation as alleged herein. Mr. Hollin was deprived of transacting in a lawful, non-manipulated, competitive market for Physical and NYMEX Platinum and Palladium and otherwise suffered injury to his business or property as a direct and proximate result of Defendants' unlawful conduct.

31. Plaintiff **KPFF Investment, Inc.** f/k/a KP Investments, Inc. ("KPFF") is a

California corporation with its principal place of business in Irvine, California. During the Class Period, KPFF sold physical platinum and palladium (99.95% purity) at artificial prices proximately caused by Defendants' unlawful manipulation as alleged herein. KPFF was deprived of transacting in a lawful, non-manipulated, competitive market for Physical and NYMEX Platinum and Palladium and otherwise suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

32. Plaintiff **White Oak Fund LP** ("White Oak") is a private placement fund headquartered in Burr Ridge, Illinois. During the Class Period, White Oak sold NYMEX platinum futures contracts at artificial prices proximately caused by Defendants' unlawful manipulation as alleged herein. White Oak was deprived of transacting in a lawful, non-manipulated, competitive market for Physical and NYMEX Platinum and Palladium and otherwise suffered injury to its business or property as a direct and proximate result of Defendants' unlawful conduct.

B. Defendants

33. Whenever in this Complaint reference is made to any act, deed, or transaction of any entity, the allegation means that the corporation engaged in the act, deed, or transaction by or through its officers, directors, agents, employees, or representatives while they were engaged in the management, direction, control, or transaction of the entity's business or affairs.

BASF

34. Defendant BASF Metals Limited f/k/a Engelhard Metals Limited ("**BASF**") is a company organized and existing under the laws of the United Kingdom with its principal place of business in London, England. In 2006, BASF's ultimate parent company, BASF Societas Europaea ("**BASF SE**"), the largest chemical producer in the world, acquired Engelhard Corporation of New Jersey. Engelhard Corporation was one of the largest manufacturers of

catalytic converters in the world. As part of the acquisition of Engelhard Corporation, BASF SE also acquired Engelhard Metals Limited, which was a Fixing member and a market-making member of the London Platinum and Palladium Market (“LPPM”). Through its acquisition of Engelhard Metals Limited, BASF became a Fixing member, which supported, in substantial part, its business (along with other BASF entities such as BASF Catalysts LLC and BASF Corporation) in manufacturing catalytic converters, a significant input of which is platinum and palladium. In 2012, BASF SE changed the name of Engelhard Metals Limited to BASF Metals Limited.

35. BASF’s “principal activity is precious metals commodity dealing.” BASF engages in proprietary trading “in the precious metals markets to generate profit” and the “main objectives of [BASF] are to ensure supply of platinum group metals to all of BASF [SE]’s operating divisions while at the same time taking advantage of opportunities in the precious metal markets as and when they exist, to grow profit.”⁹ As part of its trading activities, BASF “enters into derivative contracts with its customers which comprise precious metals forwards, futures and options held for trading and foreign exchange forward contracts.”¹⁰ During the Class Period, BASF (f/k/a Engelhard Metals Limited) was a participating member in the Fixing and was a market-making member of LPPM.

36. BASF SE maintains an extraordinarily complex web of corporate entities underneath it. BASF Corporation f/k/a Engelhard Corporation is based in New Jersey (and a Delaware-registered company). BASF’s Catalyst website, catalysts.basf.com, lists all of the separate BASF companies that are part of the Catalysts Division, among them BASF Corporation and BASF Metals Limited. BASF Corporation is the parent of BASF Catalysts

⁹ BASF Metals Limited, Annual Report and Financial Statements (Dec. 31, 2015).

¹⁰ BASF Metals Limited, Annual Report and Financial Statements (Dec. 31, 2013).

LLC and holds itself out as “the global leader in catalysts.” BASF’s website also describes an entity called “BASF Precious Metals Services,” which “is a full service provider of precious metals products and services [] that leverages [BASF’s] unparalleled market insight and decades of precious metals sourcing, trading, and hedging expertise to create a tangible competitive advantage for BASF and [BASF’s] industrial customers.” “BASF Precious Metals Services are global and vertically integrated.” BASF Precious Metals Services provides “24/7 access to world metals exchanges & key bullion centres via trading offices in [among other places] Iselin, New Jersey” and is a member of “The Chicago Mercantile Exchange (CME)” and “a founding member of the London Platinum and Palladium Market (LPPM).” BASF Corporation serves as an approved carrier, assayer, and refiner of platinum and palladium for CME Group in the U.S. BASF Corporation also provides CME Group approved platinum and palladium brands. This branded physical platinum and palladium is deliverable against NYMEX platinum and palladium futures and options contracts. BASF and its related entities hold themselves out as “one of the world’s largest traders of precious metals, with a strong emphasis on platinum group metals.”

37. BASF SE’s precious metals operations include “trading offices” operated by BASF Corporation and BASF Metals Limited, among other BASF entities. BASF Corporation has shared employees and directors with BASF Metals Limited. For example, from 2007 to 2011, Frank A. Bozich, an executive at BASF Corporation of New Jersey (and, prior to the Engelhard acquisition, an executive at Engelhard Corporation) and, at different times, President of BASF’s Catalysts Division and Group Vice President of Precious and Base Metals Services for BASF, was a director of BASF Metals Limited. BASF Metals Limited also advertised for positions in New Jersey, where BASF Corporation also employs precious metals traders, including precious metals trader positions. Such advertisement noted that part of this role

included “quoting prices to all of [BASF’s] customers both internal and external and leveraging [BASF’s] market insight to add value by making independent trading decisions within the mandate of authority granted by the [BASF] management.” Such advertisement further noted that part of this role included, “assist[ing] the Director, Global Trading in devising profitable strategies together with action plans to achieve the overall business goals and objections . . . [including by] positioning the books to ensure a stable supply of physical metal to all BASF operating units and external customers whilst also actively managing metal inventories to ensure efficient use of the allocated balance sheet.”

38. BASF holds substantial market share in Physical and NYMEX Platinum and Palladium. BASF executes client trades in Physical and NYMEX Platinum and Palladium. BASF also conducts a large amount of proprietary trading in Physical and NYMEX Platinum and Palladium. BASF and BASF clients can make orders at the Fixing price. Indeed, during the Fixing, BASF and BASF Corporation’s New Jersey-based precious metals traders were in constant communication with BASF’s participant in the Fixing. These New Jersey-based precious metals traders would update order information during the Fixing and provide this updated order information to BASF’s participant in the Fixing as the Fixing was conducted. BASF’s participant in the Fixing provided information on the status of the Fixing to the BASF and BASF Corporation New Jersey-based precious metals traders. The New Jersey-based precious metals traders would make trades in Physical and NYMEX Platinum and Palladium as the Fixing progressed based on information received from the Fixing (including proprietary trading such as trading in futures and options on NYMEX for profit and for hedging purposes). The New Jersey-based BASF and BASF Corporation precious metals traders would provide commentary on the Fixing to BASF’s clients and other BASF SE entities. During the Class

Period, BASF entered directly into platinum and palladium transactions with members of the Class.

Goldman Sachs

39. Defendant Goldman Sachs International (“**Goldman Sachs**”) is a financial services company and a subsidiary of The Goldman Sachs Group, Inc. Goldman Sachs International is organized and exists under the laws of the United Kingdom with its principal place of business in London, England. Goldman Sachs also maintains precious metals trading operations in New York, New York. During the Class Period, Goldman Sachs was a participating member in the Fixing and a market-making member of the LPPM. The term Goldman Sachs includes Goldman Sachs International and its subsidiaries and affiliates.

40. Goldman Sachs holds substantial market share in Physical and NYMEX Platinum and Palladium. Goldman Sachs executes client trades in Physical and NYMEX Platinum and Palladium. Goldman Sachs and Goldman Sachs clients can make orders at the Fixing price. Goldman Sachs operates electronic platforms for trading platinum and palladium. Goldman Sachs conducts a large amount of proprietary trading in Physical and NYMEX Platinum and Palladium. During the Class Period, Goldman Sachs entered directly into platinum and palladium transactions with members of the Class.

HSBC

41. Defendant HSBC Bank USA, N.A. (“**HSBC**”), a subsidiary of HSBC Holdings plc, is a Delaware banking and financial services company. HSBC maintains its principal place of business in McLean, Virginia. HSBC also maintains a branch in London, England. During the Class Period, HSBC was a participating member in the Fixing and a market-making member of the LPPM. The term HSBC includes HSBC Bank USA, N.A. and its subsidiaries and

affiliates.

42. HSBC holds substantial market share in Physical and NYMEX Platinum and Palladium. HSBC executes client trades in Physical and NYMEX Platinum and Palladium. HSBC and HSBC clients can make orders at the Fixing price. HSBC operates electronic platforms for trading platinum and palladium. HSBC conducts a large amount of proprietary trading in Physical and NYMEX Platinum and Palladium. HSBC also serves as an approved platinum and palladium depository and weighmaster for CME Group in the U.S. During the Class Period, HSBC entered directly into platinum and palladium transactions with members of the Class.

Standard Bank

43. Defendant ICBC Standard Bank plc (“**Standard Bank**”),¹¹ is a banking and financial services company organized and existing under the laws of the United Kingdom. It maintains its principal place of business in London, England. During the Class Period, Standard Bank was a participating member in the Fixing and a market-making member of the LPPM. Prior to the launch of LMEbullion in December 2014, Standard Bank was the Chair of the London Fixing. The term Standard Bank includes Standard Bank plc and its subsidiaries and affiliates. Standard Bank Group Limited is licensed by the New York Department of Financial Services with its New York headquarters located at 520 Madison Avenue, New York, New York 10022. ICBC is also licensed by the New York Department of Financial Services with its New York headquarters located at 725 Fifth Avenue, New York, New York 10022.

44. Standard Bank holds substantial market share in Physical and NYMEX Platinum

¹¹ Up until 2015, ICBC Standard Bank plc was named Standard Bank plc. In February 2015, Standard Bank’s parent company, Standard Bank Group Limited, sold a majority stake in Standard Bank to the Industrial and Commercial Bank of China (“ICBC”).

and Palladium. Standard Bank executes client trades in Physical and NYMEX Platinum and Palladium. Standard Bank also conducts a large amount of proprietary trading in Physical and NYMEX Platinum and Palladium. Standard Bank and Standard Bank clients can make orders at the Fixing price. Indeed, during the Fixing, Standard Bank's New York-based precious metals traders were in constant communication with Standard Bank's participant in the Fixing. These New York-based precious metals traders would update order information during the Fixing and provide this updated order information to Standard Bank's participant in the Fixing as the Fixing was conducted. Standard Bank's participant in the Fixing provided information on the status of the Fixing to Standard Bank's New York-based precious metals traders. The New York-based precious metals traders also made trades in Physical and NYMEX Platinum and Palladium as the Fixing progressed and based on information received from the Fixing (including proprietary trading such as trading NYMEX futures and options for profit). Standard Bank's New York-based precious metals traders also provided commentary on the Fixing to Standard Bank clients. During the Class Period, Standard Bank entered directly into platinum and palladium transactions with members of the Class.

45. Standard Bank is a member of NYMEX (COMEX) and maintains two seats. As a member of NYMEX, Standard Bank, traded platinum and palladium futures and options for proprietary accounts during the Class Period. Indeed, on at least one occasion during the Class Period, the COMEX Business Conduct Committee initiated disciplinary proceedings against Standard Bank because it had violated exchange rules, finding that it had jurisdiction over Standard Bank because "it was a COMEX member and that on . . . February 15, 2013, Standard Bank executed four EFRP transactions in which Standard Bank and another market participant

were counterparties.”¹²

46. Standard Bank’s website holds itself out as having a substantial presence worldwide including in New York.¹³ Up until 2016, Standard Bank had a substantial precious metals trading desk in New York.¹⁴ Standard Bank has at least three U.S. subsidiaries that generate millions of dollars of revenue for Standard Bank and employ dozens of individuals in the U.S. Each of these subsidiaries is registered in Delaware with corporate offices located in this District. These U.S. subsidiaries are also regulated by various federal and state agencies. Standard Bank holds itself out as offering “a 24 hour service around the globe for ICBC to trade FX and precious metals via accounts through seamless connectivity between the systems in Beijing, London and New York running round the clock”¹⁵ enabling Standard Bank to “buy/sell precious metals (via account) and foreign exchange on behalf of customers” and to provide “real-time prices to worldwide buyers and sellers of precious metals.”

Co-Conspirators

47. Various other entities and individuals unknown to Plaintiffs at this time – including other major platinum and palladium banks and institutions – participated as co-

¹² Notice of Disciplinary Action Against Standard Bank plc, File No. COMEX 14-9718-BC (Aug. 15, 2014), *available at* <http://www.cmegroup.com/tools-information/lookups/advisories/disciplinary/COMEX-14-9718-BC-STANDARD-BANK-PLC.html#pageNumber=1>. Further, in another NYMEX disciplinary proceeding against a non-member Standard Bank entity, the NYMEX found that “two traders employed by Standard Bank prearranged five trades totaling 90 lots in Crude, Palladium and Platinum for the purpose of transferring positions between two proprietary accounts with common beneficial ownership.” Notice of Disciplinary Action Against The Standard Bank of South Africa Limited, File No. NYMEX 12-9082-BC (Feb. 14, 2013), *available at* <http://www.cmegroup.com/tools-information/lookups/advisories/disciplinary/NYMEX-12-9082-BC-THE-STANDARD-BANK-OF-SOUTH-AFRICA-LIMITED.html#pageNumber=1>.

¹³ ICBC Standard Bank plc Website, *available at* https://www.icbcstandardbank.com/CorporateSite/ContactUs#New_York.

¹⁴ Reuters, *ICBC Standard Bank sheds NY precious metals traders* (May 18, 2016), *available at* <http://af.reuters.com/article/commoditiesNews/idAFL5N18F4TO>.

¹⁵ ICBC History, <http://www.icbc-ltd.com/ICBCLtd/About%20Us/ICBC%20History/>.

conspirators in the acts complained of, and performed acts and made statements that aided and abetted and were in furtherance of the unlawful conduct alleged herein.

48. Defendants' co-conspirators included BASF Corporation, BASF Catalysts LLC, UBS AG, UBS Securities LLC (UBS AG and UBS Securities LLC and their subsidiaries and affiliates are referred to as "UBS"), and The London Platinum and Palladium Fixing Company Ltd ("LPPFC").

49. UBS is the result of the 1998 merger of two leading Swiss banks: Swiss Bank Corporation, and Union Bank of Switzerland. Both Swiss Bank Corporation and Union Bank of Switzerland had extensive operations in precious metals. Thus, since its inception UBS has operated a large precious metals business. UBS holds itself out as "a leading provider of physical and derivative precious metal products to a broad range of customers around the globe."¹⁶

50. UBS executes client trades in the physical platinum and palladium markets, on NYMEX, in platinum and palladium derivatives, and in shares of platinum and palladium ETFs. UBS operates electronic platforms for trading platinum and palladium products. UBS also conducts proprietary trading in the platinum and palladium markets. At least some of UBS's proprietary platinum and palladium trading is managed from the Stamford office of UBS Securities LLC. During the Class Period, UBS was a market-making member of the LPPM, cleared platinum and palladium transactions, and entered directly into Standard Bank entered directly into platinum and palladium transactions with members of the Class.

51. Another co-conspirator entity was The London Platinum and Palladium Fixing Company Ltd. ("LPPFC"). LPPFC is a private company organized and existing under the laws

¹⁶ UBS Website, Precious Metals, <http://www.ubs.com/global/en/investment-bank/institutions/foreign-exchange/precious-metals.html>.

of the United Kingdom with its principal place of business in London, England. LPPFC is 100% owned and controlled by Defendants BASF, Goldman Sachs, HSBC, and Standard Bank.

52. LPPFC is indistinguishable from the Defendants for jurisdictional purposes. LPPFC was founded in 2004 by the four entities that then conducted the Fixing. From 2008 to 2014, LPPFC was owned and controlled by the Defendants, the Defendants were the only members of the LPPFC, the day to day business of LPPFC was conducted by a group of directors who were selected by the Defendants (and typically were employees of the Defendants), the LPPFC had no employees, the LPPFC had no business other than the Fixing, and all (or nearly all) of LPPFC's revenue was derived from the Defendants' membership fees and licensing data from the Fixing such that LPPFC was completely and totally financially dependent on the Defendants. All LPPFC directors were employees (mostly, if not all, senior commodities traders) of the Defendants, including: Amir Ravan of Goldman Sachs; David Benjamin Rose of HSBC; John Patrick Metcalf of BASF; Peter Dennis Drabwell of HSBC; Peter Hirst of Goldman Sachs; Rupert Prest of Standard Bank; and Katrina Cvijovic of Standard Bank. The LPPFC has never maintained any office space instead residing as a legal fiction with its correspondence address at a corporate law firm. The LPPFC has claimed a "total exemption" from audit for each year it has been in existence.

53. The LPPFC's only function is "to take on and continue the promotion, administration and conduct of the London Platinum and Palladium Market Fixing."¹⁷ As such, at all times LPPFC was an instrumentality in Defendants' conspiracy alleged in this Complaint. LPPFC merely served as a shell for the operation of the Fixing, as a vehicle for Defendants'

¹⁷ LPPFC Memorandum of Association (filed Dec. 1, 2004). Although the LPPFC's incorporation documents describes a variety of activities that LPPFC engages in, all of these activities relate to the administration of the platinum and palladium Fixing.

conspiracy, and as a legal fiction for the Defendants. Defendants' conspiracy – via LPPFC – was targeted at and had substantial depressive effects on the platinum and palladium Fixing price and Physical and NYMEX Platinum and Palladium traded in the U.S. At all times, LPPFC and its members and directors knew that the Fixing – and the Fix prices reached thereby – had a substantial and direct effect on Physical and NYMEX Platinum and Palladium traded in the U.S.

FACTUAL ALLEGATIONS

I. BACKGROUND ON PLATINUM AND PALLADIUM AND RELATED INVESTMENTS

54. Platinum is a dense, highly unreactive gray-white metal. Palladium is a sister metal to platinum that is silvery-white. Platinum and palladium have similar chemical properties, but palladium has a lower melting point and is less dense than platinum. Platinum and palladium have a variety of industrial and commercial uses such as in catalytic converters,¹⁸ laboratory equipment, electrodes, and dentistry equipment. However, as noted by a U.S. Senate Subcommittee report, “While platinum and palladium – like gold and silver – have industrial uses, all four have traditionally been traded internationally as precious metals, held primarily for their exchange value rather than industrial use.”¹⁹

55. Platinum and palladium have a relatively recent history. Platinum was only categorized a precious metal in the mid-1700s and palladium was isolated as a separate metal

¹⁸ A catalytic converter is a vehicle emissions control device that converts toxic pollutants in exhaust gas to less toxic pollutants. Catalytic converters are most often used in automobiles. Palladium is primarily used for catalytic converters in gasoline driven cars (mostly driven in areas such as the U.S. and China) whereas platinum is primarily used in catalytic converters for diesel fuel cars (mostly driven in areas such as Europe).

¹⁹ See U.S. Senate Permanent Subcommittee on Investigations, WALL STREET BANK INVOLVEMENT WITH PHYSICAL COMMODITIES (Dec. 5, 2014) (“Senate Report”), at 9-10, *available at* <http://www.hsgac.senate.gov/subcommittees/investigations/hearings/wall-street-bank-involvement-with-physical-commodities-day-one>. Although the Senate investigation did not specifically examine platinum and palladium, it examined multiple commodities markets.

around 200 years ago.

A. The London Platinum and Palladium Fixing Price Process

56. The Fixing was a relatively recent creation. The London Platinum Quotation, the predecessor to the Fixing, was established in 1973, and was a twice-daily indication of the market price for spot platinum, reported by some of the principal companies dealing in this precious metal. However, this was an informal trading system, and in 1987 it was formalized via the establishment of the LPPM. Two years later in 1989 the Fixing was formally established for platinum and palladium.

57. During the Class Period, the Fixing occurred twice daily: 9:45 a.m. GMT (the AM Fixing) and 2:00 p.m. GMT (the PM Fixing), the latter to accommodate the U.S. trading day. During the Class Period, the four participating members in the Fixing were Defendants Standard Bank, BASF (obtaining its seat after its acquisition of Engelhard Metals Limited in May 2006), Goldman Sachs, and HSBC. During the Class Period, the Fixing was conducted by a Chair who was an LPPFC member (*i.e.*, a Defendant). The Chair was selected annually by the LPPFC members (typically rotating among the Defendants). Prior to the launch of LMEbullion in December 2014, Standard Bank was the Chair of the Fixing.

58. The Fixing was held out as an organized “Walrasian” auction among the Defendants for the spot price of physical platinum and palladium. Market participants sent their orders to the Defendants. In a competitive market, not subject to the Defendants’ manipulative conduct, the Defendants would have consolidated their respective customer orders, as well as any proprietary orders from their own trading desks.

59. The Fixing for platinum and palladium was conducted in tandem with platinum typically occurring first immediately followed by palladium. The Fixing began with the Chair announcing a starting price (also known as the “Opening Price”) for “loco” (short for location)

London or Zurich platinum (after the process described below for platinum was complete, the same process would play out for palladium), stated in U.S. dollars, which was ostensibly at or near the current spot price. Each of the remaining three participating fixing members then declared themselves as either a net buyer or a net seller, or as having no interest at the starting price.

60. If there was no buying and no selling interest at the starting price from any participating member, the Chair announced the Opening Price as the “fixed” price. If at the starting price there was only a selling or a buying interest, the Chair asked for figures and then either: (a) declared the price as “Fixed” if the quantity offered or sought is matched exactly or is within 4,000 troy ounces;²⁰ or (b) moved the Opening Price lower or higher until there is two-way interest – *i.e.*, a match between a net buyer and a net seller.

61. If the Chair moved the price to obtain two-way interest, the increments in which the moves occurred was determined by: (a) the prevailing bid/offer price in the platinum or palladium futures market as quoted on the CME adjusted to the physical London spot market using a prevailing Exchange for Physical (*i.e.*, an exchange of a position in the underlying physical instrument for a corresponding futures position); (b) the prevailing bid/offer price on electronic trading platforms representing the spot market price; and (c) the level of buying and selling interests declared in the Fixing.

62. The Chair chose the level of price increments it considered necessary in order to match supply with demand.

63. At any time during the Fixing, a participating member or its customers could have

²⁰ A troy ounce (oz t) is a unit of measure, most commonly used to gauge the mass of precious metals. One troy ounce is defined as exactly 31.1034768 grams. There are 14.583 troy ounces in one pound.

increased or decreased an order, withdrawn a previously declared buying or selling order, or placed a new order. In the event of such an occurrence, a participating member could have called a “flag” to suspend the Fixing so that it could recalculate its overall interest. When the flag was called, the Chair was not permitted to call the platinum or palladium prices “Fixed.”

64. When buy and sell orders were matched, the Chair declared the prices for platinum and palladium fixed, stated the time at which they have been fixed and the final price in U.S. dollars,²¹ and the fix prices were disseminated for broad publication. Once the Fix prices for platinum and palladium had been declared by the Chair, buy and sell orders declared in relation to those Fix prices could not be altered or withdrawn by the firms participating in the Fixing. However, at no point in time before, during, or after the Fixing were the Defendants restricted from trading in Physical and NYMEX Platinum and Palladium. Each of the Defendants (as well as co-conspirator UBS) had precious metals traders in the U.S. and elsewhere. These traders would receive information from the Fixing, transmit information to the participants in the Fixing, and provide commentary to clients and other entities on the status of the Fixing. Each of the Defendants’ precious metals traders would also actively trade in Physical and NYMEX Platinum and Palladium before, during, and after the Fixing, including proprietary trading, and including by utilizing real time, non-public information from the participants in the Fixing.

65. The Chair then matched up the participating firms’ orders and specified the trades that must then be executed between the participating firms. The Chair filled the largest seller’s order first by matching that order with the largest buyer’s order, with the participating firms’

²¹ The LPPM generally expresses prices in U.S. dollars. The Chair also provided the equivalent trading prices in pounds sterling and euros using the then-prevailing exchange rates published on Bloomberg or Reuters and read out these rates at the end of the call.

orders then being matched in descending order size.

66. Where the Chair had been unable to match supply and demand exactly and had instead declared the price as fixed when the difference between quantities of platinum and palladium bid and offered was 4,000 troy ounces or less, the Chair pro-rated the difference between supply and demand between the participating firms.

67. As described in more detail below at paragraphs 79 to 103, platinum- and palladium-based financial products, such as futures and options traded on the NYMEX, are directly impacted by the physical prices assessed through the Fixing.

68. In an open and transparent system of price discovery for platinum and palladium, all market participants should have the opportunity to see in real-time bids and offers for platinum and palladium to gauge their prices. However, the Fixing was designed in a manner that held market participants hostage to the dealings of four large and heavily self-interested participants in the platinum and palladium market, *i.e.*, the Defendants. This gave the Defendants the opportunity and motive to manipulate the prices reached by the Fixing to their advantage, particularly with respect to their own holdings in Physical and NYMEX Platinum and Palladium. As noted above, the Defendants' precious metals traders were in constant communication with the participants in the Fixing and were simultaneously executing trades in Physical and NYMEX Platinum and Palladium.

69. During the Class Period, the Fixing was carried out by the Defendants via the LPPFC. However, on October 16, 2014, the LPPFC announced that it would no longer bear responsibility for administering the Fixing.²² Instead, from December 1, 2014 onward, the LME would be the new administrator of the Fixing. The LME replaced the original Fixing with

²² LPPFC Press Statement (Oct. 16, 2014), *available at* <http://www.sharpspixley.com/uploads/StatementfromLondonPlatinumandPalladiumFixingCompanyLtd161014.pdf>.

LMEbullion which “provides a fully automated price-discovery process, holding two daily auctions at 9:45am and 2pm. Authorised traders participate through a secure web interface, where they can view the auction price and each submit their interest until a final price is set. LMEbullion . . . provid[es] near real-time auction commentary and anonymised buy/sell figures.”²³

70. LMEbullion requires a quorum of participants for an auction to progress.²⁴ When the auction commences, traders indicate their interest in displayed potential execution prices. The price is fixed when the interest of all participants is “within the permitted tolerance.”²⁵ If the interest is outside of the permitted range, a new price is calculated and displayed in another “round” and participants re-select their interest in the new potential execution prices until a price is set. Once prices are set, prices are disseminated via LMEbullion, LME.com and data distributors.

71. During the Class Period, the Fixing was associated with the LPPM. The LPPM is a trade association that was established in 1987. The LPPM is overseen by a Chairman and Management Committee, which are elected annually by LPPM members. The LPPM Management Committee consists of a small group of representatives from major platinum and palladium banks and institutions. The Defendants have been actively involved in the Management Committee. For example, as of July 2015, Defendants BASF, HSBC, and Standard Bank each had a representative on the Management Committee and Standard Bank’s

²³ LME Press Release, *LME announces successful launch of LBMA Platinum and Palladium Prices* (Dec. 4, 2014), available at www.lme.com/news-and-events/press-releases/press-releases/2014/12/lme-announces-successful-launch-of-lbma-platinum-and-palladium-prices.

²⁴ LME Press Release, *LBMA Platinum Price and LBMA Palladium Price* (undated), available at www.lme.com/~media/Files/Metals/Precious%20Metals/LBMA%20Platinum%20and%20Palladium%20Prices%20from%20the%20LME.pdf

²⁵ *Id.*

representative served as Vice Chairman. As of 2017, the LPPM has 10 market-making full members (including Defendants BASF, Goldman Sachs, HSBC, and Standard Bank), 6 ordinary full members, and 36 associate members. As of 2011, the LPPM had 9 market-making full members (including Defendants BASF (at that time known as Engelhard Metals Limited), Goldman Sachs, HSBC, and Standard Bank) and 2 ordinary full members. Full membership is open to companies which are both: (a) recognized by the LPPM as being currently engaged in trading and dealing in platinum and palladium and have an appropriate level of net assets and experience; and (b) offer additional services including market-making, clearing services, refining, or manufacturing. The market-making members are the heart of the LPPM. The market-making members quote buying and selling prices for spot delivery and provide liquidity to the market. The Defendants are all market-making members of the LPPM. Indeed, during the Class Period, the Defendants composed almost 50% of the market-making members of the LPPM.

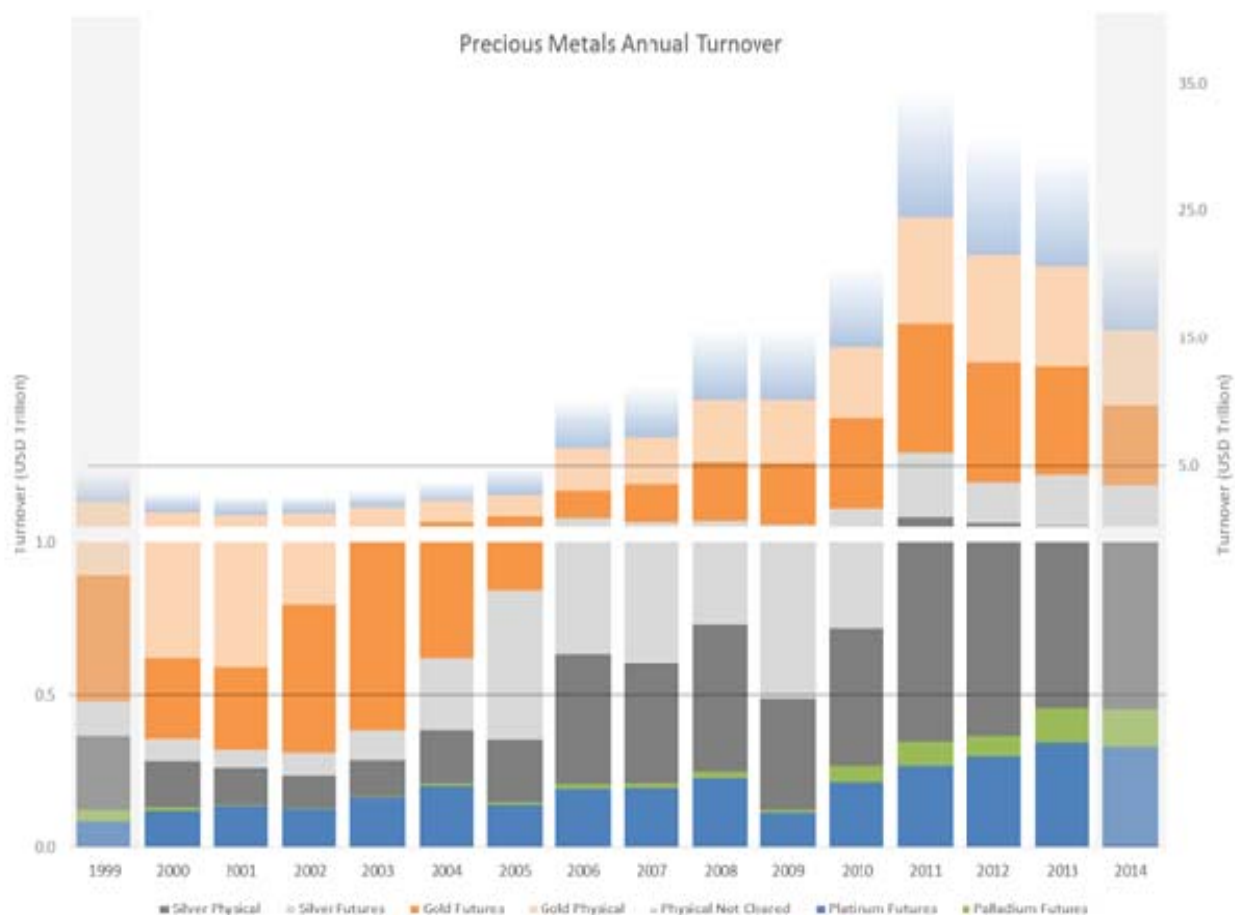
72. The LPPM hosts various conferences and social events. Some of these conferences and social events are held in collaboration with the London Bullion Market Association (“LBMA”), which is a similar trade association for gold and silver. Such events include LPPM/LBMA Cocktail Receptions, Precious Metals Summits, The Annual LBMA/LPPM Precious Metals Conference, London Platinum Week, and the LPPM Annual General Meeting. Certain of these events were held in the U.S. Representatives of the Defendants were often in attendance at these events and these events were another venue at which Defendants had opportunities to discuss the manipulation at issue here.

B. The Fixing Directly Impacts Prices for Physical and NYMEX Platinum and Palladium

73. As shown in the below chart, the annual turnover for platinum and palladium

transactions is orders of magnitude smaller than related annual turnover for gold and silver. As the turnover volume reflects, there are a greater number of gold and silver transactions at any point in time than there are platinum and palladium transactions. This means that, all other things being equal, there are greater opportunities for price discovery in gold and silver markets than there are in the markets for platinum and palladium. The fact that the platinum and palladium market is smaller (and more thinly traded) than related markets for gold and silver also means that price manipulation is easier to achieve and its effects more long lasting in platinum and palladium.

CHART 1



1. Physical Platinum and Palladium

74. The market for physical platinum and palladium operates on an over-the-counter (“OTC,” *i.e.*, between private parties) basis. Because there is no centralized OTC exchange, the price of physical platinum or palladium is often determined by reference to the Fix price, which the Defendants set through the Fixing during the Class Period. The Fixing prices acted as benchmark prices and were widely published by the Defendants and others.

75. Physical platinum and palladium are generally traded in bars measured in troy ounces or coins of various sizes, of agreed to specifications such as purity. Because physical platinum and palladium is traded in various amounts, the physical platinum and palladium market is accessible to large commodity trading entities, like the Defendants, and also to small investors, including members of the Class.

76. Some of the international demand for physical platinum and palladium is met through OTC spot contracts. A spot contract is a contract where a buyer and a seller agree to settlement (payment and delivery) on a spot date, which is normally two business days after the trade date. The settlement price is called the spot price. Sales at “spot” are often tied or keyed to the relevant metal’s Fixing on the day of the sale.

77. Major players in physical platinum and palladium include Defendants Standard Bank, BASF, HSBC, and Goldman Sachs, as well as UBS. These entities and others compete for physical platinum and palladium customers.

78. Numerous other participants enter the market for platinum and palladium from time to time, including platinum and palladium producers (*e.g.*, miners and refiners), consumers (*e.g.*, jewelers and industrials), and investors (*e.g.*, pension funds, hedge funds, and individuals). From 2009 to 2013, the autocatalyst and jewelry segments of the platinum market comprised the two largest sources of demand. In 2013, gross demand for platinum was over 8 million ounces,

and gross demand for palladium was over 9.6 million ounces.

2. NYMEX Platinum and Palladium

79. The NYMEX, a division of the CME Group located in this District, is the leading centralized exchange for platinum and palladium futures and options worldwide. Most exchange-traded platinum and palladium futures and options are traded on NYMEX, which has been designated by the CFTC as a contract market pursuant to Section 5 of the Commodity Exchange Act, 7 U.S.C. § 7. NYMEX is an organized centralized market that provides a forum for trading NYMEX platinum and palladium futures and options contracts (“NYMEX Platinum and Palladium”). NYMEX futures are standardized contracts that call for the delivery of physical platinum or palladium (99.95% purity) at a CME certified warehouse or a cash settlement, on a specified date. NYMEX options are standardized contracts that, upon exercise, call for the establishment of a platinum or palladium futures position.²⁶ A platinum or palladium futures contract is a bilateral agreement for the purchase or sale of an agreed amount of physical platinum or palladium at a specified date in the future. As such, a futures contract is simply an agreement to transact in physical platinum or palladium at a later date. Likewise, an option contract is simply an agreement to have the option to transact in physical platinum or palladium at a later date

80. Unlike OTC transactions with are done between private parties, NYMEX—through its clearinghouse, CME Clearing—is the counterparty to *all* transactions on the exchange (*i.e.*, the buyer or seller to a NYMEX contract does not have any identified counterparty other than NYMEX). CME Clearing is responsible for confirming, matching, and settling on daily basis all NYMEX platinum and palladium contracts until these contracts are

²⁶ See CME Group, Platinum and Palladium Futures and Options, *available at* <http://www.cmegroup.com/trading/metals/files/platinum-and-palladium-futures-and-options.pdf>.

either offset or delivered. CME Clearing, itself, is comprised of “clearing members”, which include affiliates of Defendants Goldman Sachs and HSBC, as well as co-conspirator UBS. Clearing members are responsible for “assuming the opposite side of each transaction”.²⁷

81. Indeed, NYMEX’s website states that “[c]learing members assume full financial and performance responsibility for all transactions executed through them and cleared by CME Clearing. They are responsible and accountable for every position they carry, whether it is for the account of a member, member firm, non-member customer, or their own account.”²⁸ CME Clearing matches buyers and sellers, and enables them to trade in circumstances where the CME and its members assume an obligation to assure performance of every trade, even if a buyer or seller defaults on a particular trade. Thus, for NYMEX platinum and palladium futures and options, there can be no more efficient enforcer of the antitrust laws than an individual or entity who trades platinum and palladium futures and options on NYMEX.

82. Moreover, as shown below at paragraphs 90 to 103, NYMEX Platinum and Palladium prices move virtually in tandem with Fix prices. Thus, by manipulating Fix prices, the Defendants necessarily manipulated futures prices and caused Plaintiffs to trade such standardized futures contracts at artificial prices levels. Although only a small percentage of all futures contracts traded each year on NYMEX and other exchanges result in actual delivery of the underlying commodities,²⁹ this does not change the fact that NYMEX prices move closely with the Fix.

83. For each NYMEX platinum and palladium futures contract, the buyer takes a

²⁷ NYMEX Clearing Membership, <http://www.cmegroup.com/company/membership/clearing/nymex.html>.

²⁸ *Id.*

²⁹ Instead of taking physical delivery of platinum or palladium, traders generally offset their futures position before their contracts mature.

“long” position on platinum or palladium, meaning it agrees to pay for a specified amount of platinum or palladium and take delivery at the expiry of the contract. The seller takes a “short” position, meaning it will make delivery and receive payment for the platinum or palladium.

84. For example, a purchaser of a NYMEX platinum or palladium futures contract can cancel or offset its future obligation to the contract market or exchange clearinghouse to take delivery of platinum or palladium by selling an offsetting futures contract. The difference between the initial purchase or sale price and the price of the offsetting transaction represents the realized profit or loss.

85. Platinum and palladium option contracts are often spoken of in terms of “puts” or “calls.” A call gives the holder of the platinum or palladium option the right, but not the obligation, to buy the underlying platinum or palladium futures contract, or the underlying metal itself, at a certain price – the “strike” price – up until a fixed point in the future (*i.e.*, the option’s expiry). A put gives the holder the right, but not the obligation, to sell the underlying platinum or palladium futures contract, or the underlying platinum or palladium itself, at the strike price until the option’s expiry. An investor that buys a put option generally expects the price of platinum or palladium to fall (or at least seeks to protect against downside risk), and an investor that buys a call option generally expects the price of the relevant metal to rise. The price at which an option is bought or sold is called the “premium.”

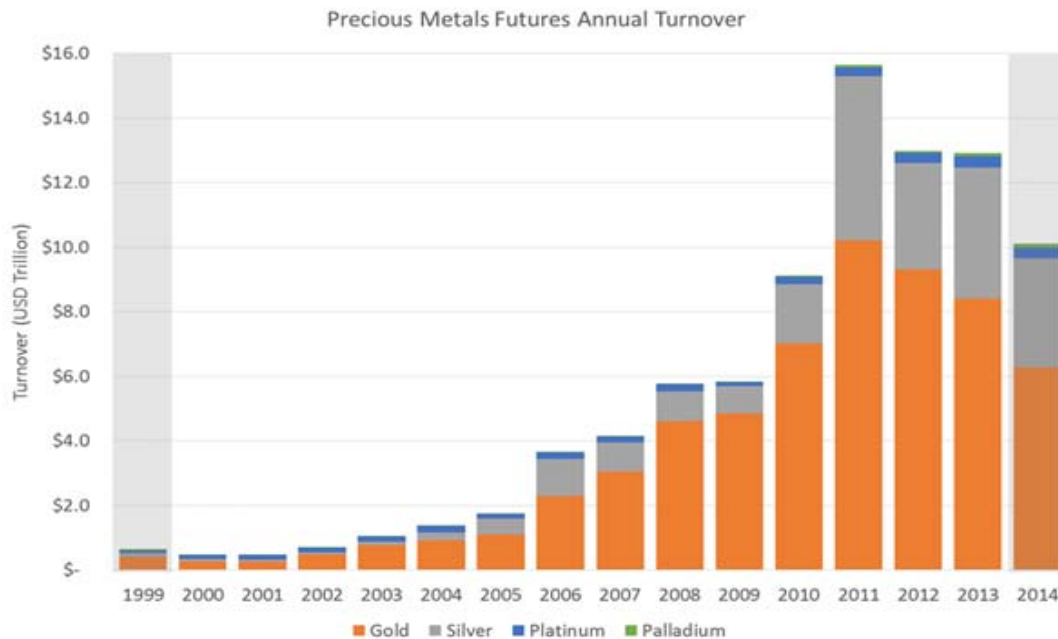
86. Through these various contracts and trades, there are many ways to “go short” (*i.e.*, profit from price decreases) or “go long” (*i.e.*, profit from price increases). The entity that is short benefits as prices fall. The seller of a futures contract, for instance, can then offset the position by purchasing another futures contract, pocketing the difference in price. The seller of a call option benefits if the spot price falls below the strike price, since the seller collects the

option premium and pays nothing to the purchaser. At expiry, if the price of platinum or palladium exceeds a call option's strike price, the rational holder will exercise the call option, which means the seller of the call option, if unhedged, will have to sell the futures contract at the strike price and cover its position, paying the difference between the prevailing price and the strike price.

87. Apart from physical platinum and palladium transactions, NYMEX futures and options are some of the most heavily traded platinum- and palladium-based financial products. The aggregate annual value of platinum futures has surpassed \$100 billion each year since 2011. The aggregate annual value of palladium futures has surpassed \$40 billion since 2011.

88. However, despite the seemingly large size of platinum and palladium futures transactions, as shown below, platinum and palladium futures transactions are orders of magnitude smaller than related gold and silver transactions.

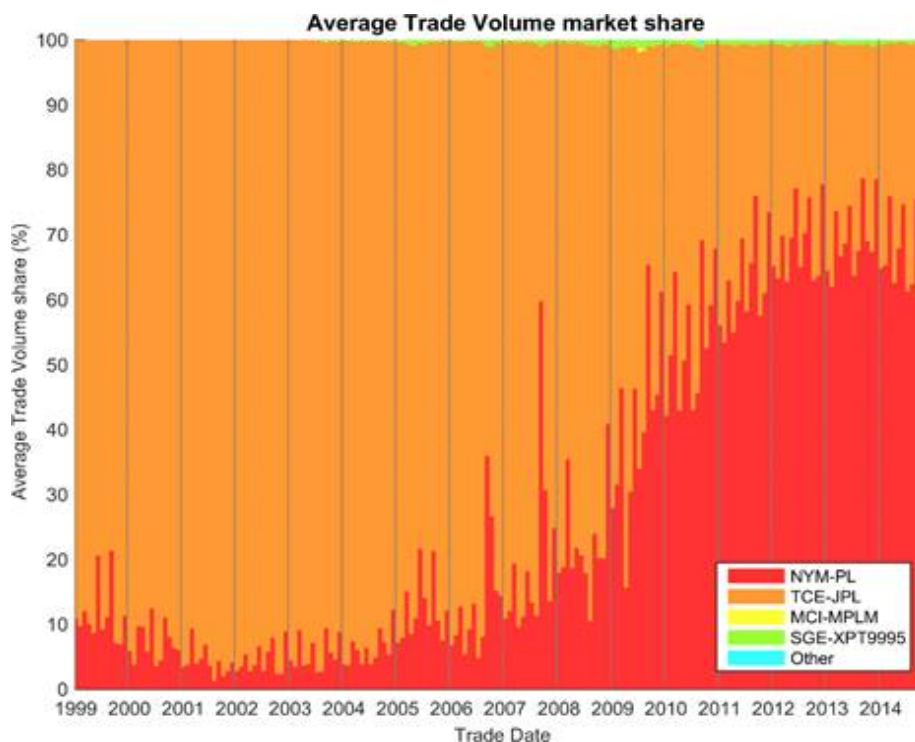
CHART 2



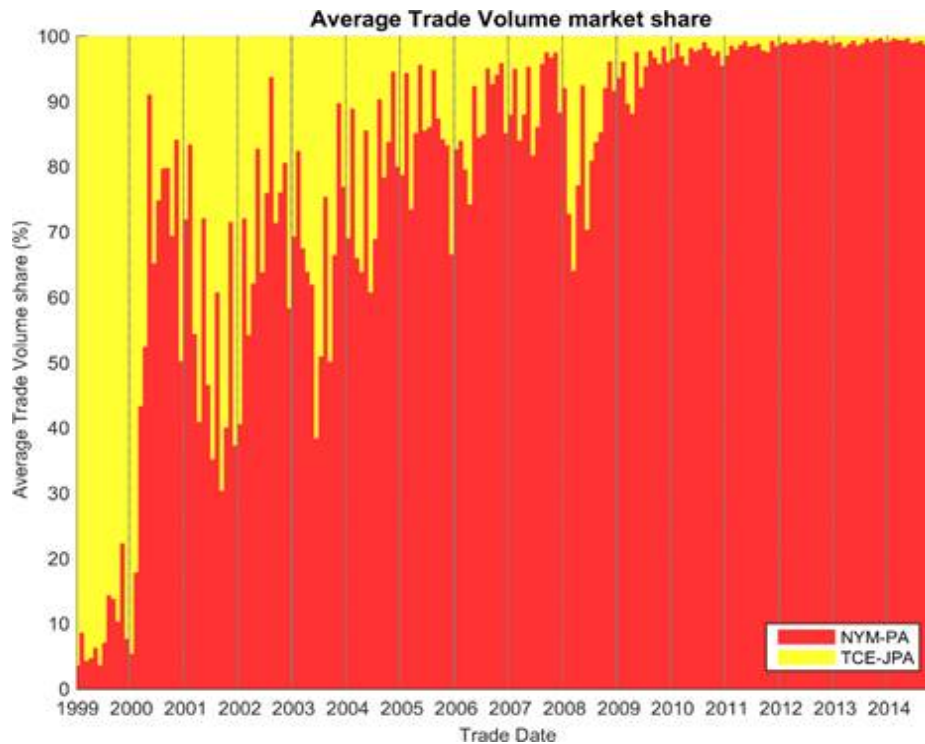
89. During the Class Period, platinum futures contracts were traded on six futures exchanges while palladium was traded on only two. As shown below, throughout the Class Period, NYMEX has been the dominant exchange for palladium futures and has increasingly been the dominant exchange for platinum futures. Notably, during the Class Period, the majority of both platinum and palladium futures were traded on NYMEX. In the below charts, NYM refers to NYMEX, TCE refers to Tokyo Commodity Exchange, MCI refers to Multi-Commodity Exchange (India), and SGE refers to the Shanghai Gold Exchange.

CHARTS 3 & 4

Exchange-Traded Platinum Contracts



Exchange-Traded Palladium Contracts



3. The Fixing impacts prices of Physical and NYMEX Platinum and Palladium

90. As stated by the LPPM:

The guiding principle behind the Fixings is that all business, whether for large or small amounts, is conducted solely on the basis of a single published Fixing price. . . . Clients around the world wishing to buy or sell precious metals may all do so at the Fixing price, upon which a small commission is generally charged. These fully transparent benchmarks are globally accepted as the basis for pricing a variety of transactions, including industrial contracts and averaging business. They may also be used as a basis for cash-settled swap and option transactions. . . . Fixing prices for gold, silver, platinum and palladium are published immediately by the various new agencies.³⁰

91. The Defendants seized upon the Fixing as a means to manipulate Physical and NYMEX Platinum and Palladium prices because the Fix prices are used as benchmarks. Many

³⁰ LBMA & LPPM, A Guide to the London Precious Metals Markets, *available at* <http://www.lppm.com/files/otcguide.pdf>.

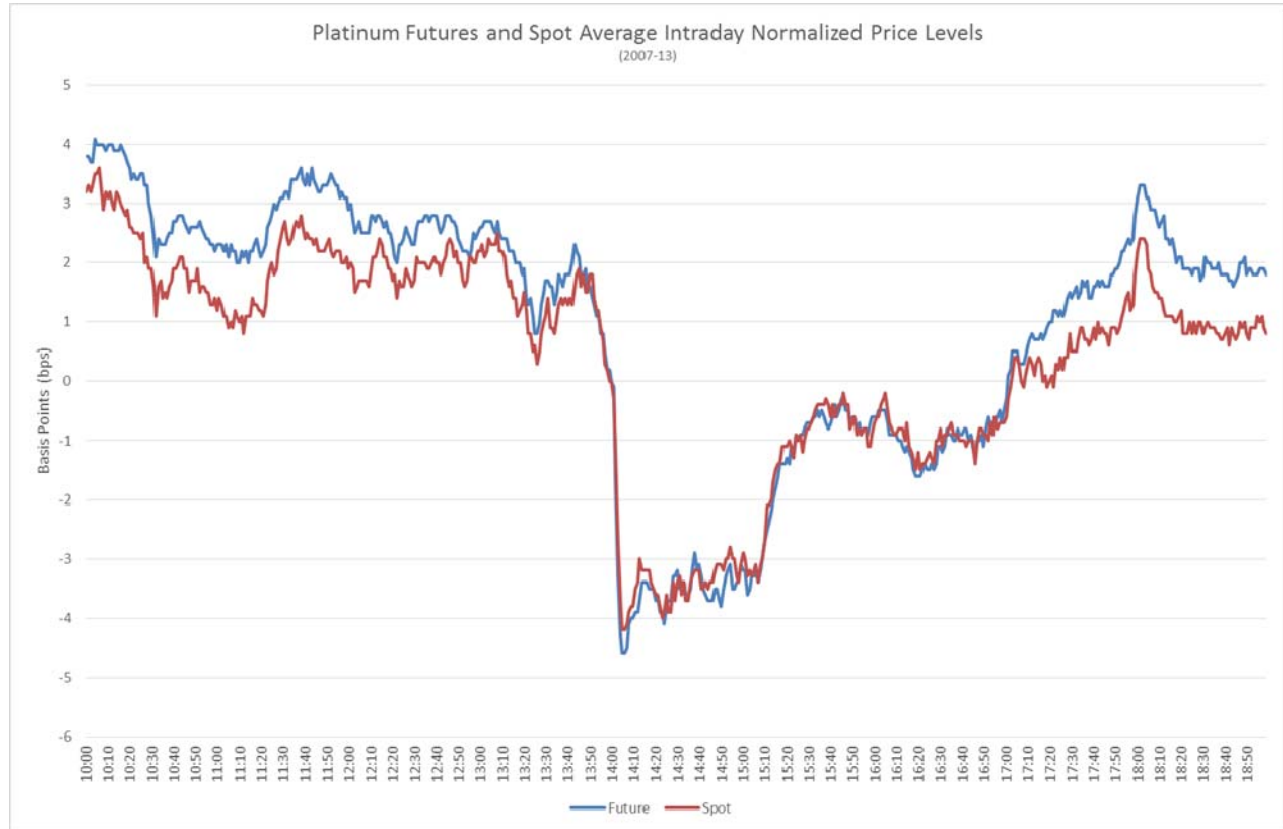
physical supply contracts – such as contracts for the sale of raw platinum or palladium by miners – explicitly incorporate or reference prices from the Fixing. The Fixing also directly impacts the price of NYMEX Platinum and Palladium. This is because exchange prices closely track the price of spot platinum or palladium. Changes in the price of one will be almost immediately reflected in the other. The spot, Fix, and NYMEX settlement prices exhibit an almost perfect correlation. This tight correlation is seen in the following charts.

CHARTS 5 & 6



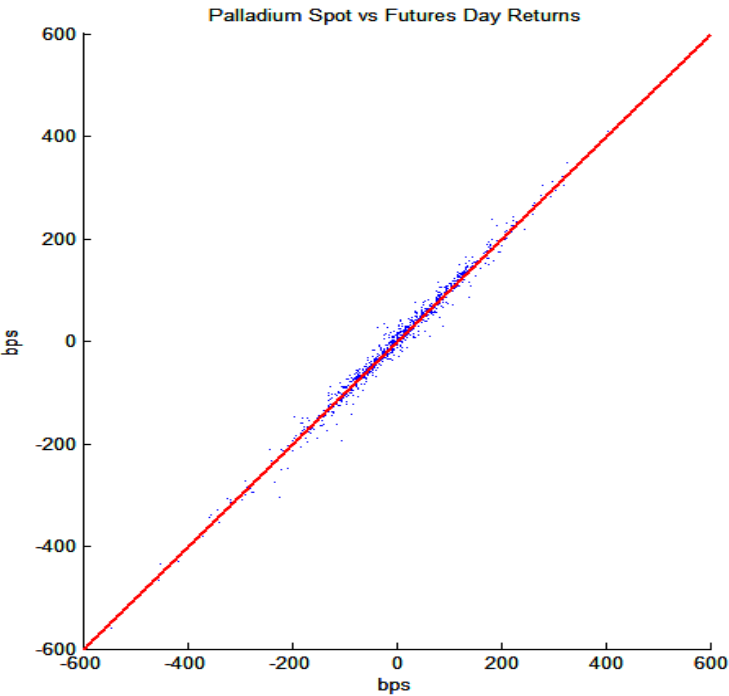
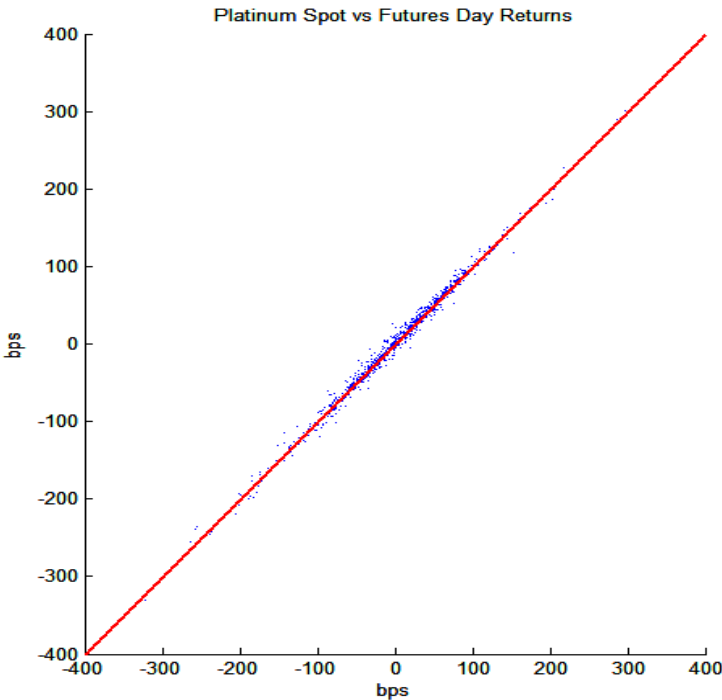


92. To confirm the correlation between prices reached at the Fixing and in the market for Physical and NYMEX Platinum and Palladium, economists retained by Plaintiffs also analyzed spot and futures price data, and concluded that NYMEX Platinum and Palladium is significantly impacted by the Fixing. The following chart depicts the daily normalized average intraday platinum spot prices (in red) and NYMEX futures prices (in blue), and illustrates how closely the spot and NYMEX prices were correlated from 2007 through 2013. For present purposes, the chart is presented to confirm that the two move in tandem. But it is also worth noting that, like many other studies performed in connection with this complaint, the data here shows a large anomalous downwards spike around the time of the Fixing – not just in spot prices, but in NYMEX prices as well.

CHART 7

93. Another way to see the tight correlation between prices in spot and futures is to plot the prices on a graph and to measure the correlation between them. On the charts below, the red line represents a theoretical line of perfect correlation. The blue dots represent actual pricing data. The tight clustering of the actual pricing data around the red line confirms that, as the Fixing prices move, so too do prices for Physical (spot) and NYMEX Platinum and Palladium.

CHARTS 8 & 9



94. The correlation coefficients of prices demonstrated by the above charts – where a correlation coefficient of “1” would be perfect correlation – are as follows:

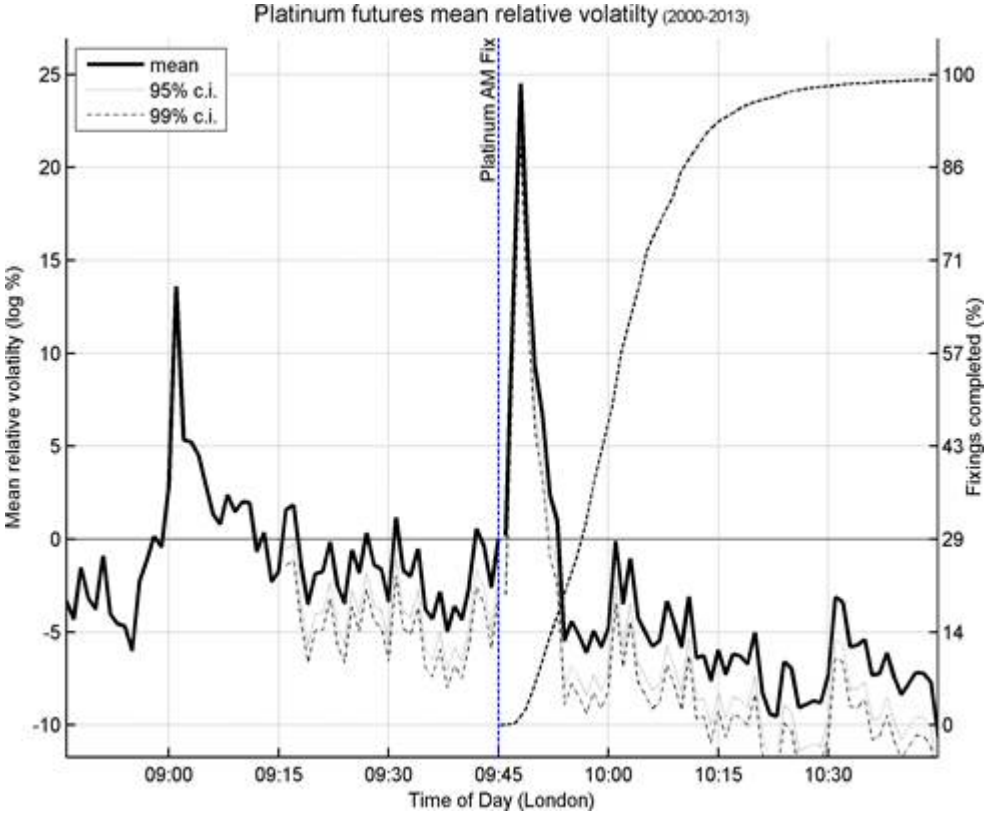
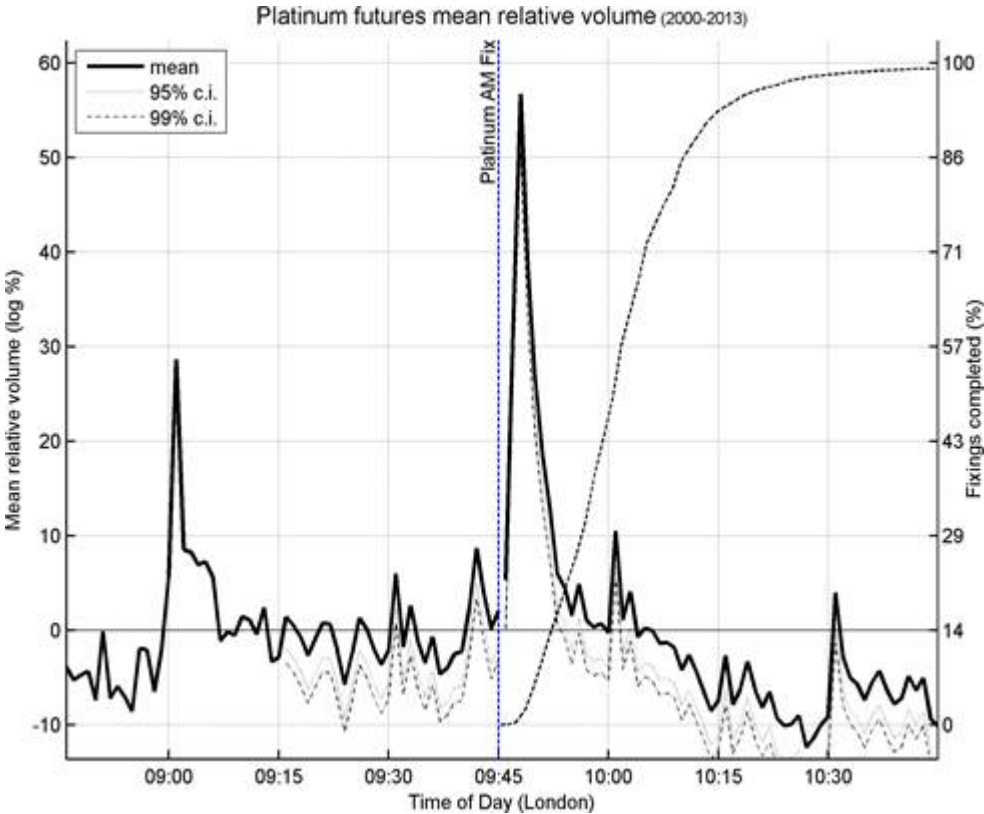
- a. Platinum Spot to Futures = 1.00
- b. Palladium Spot to Futures = 0.99

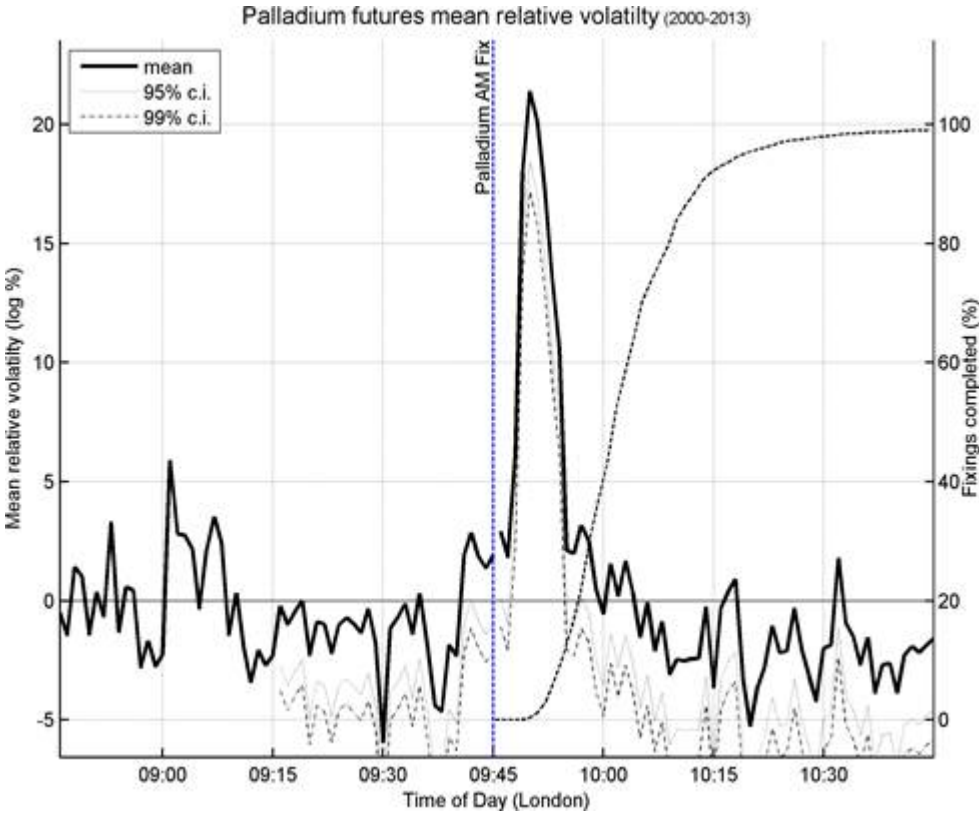
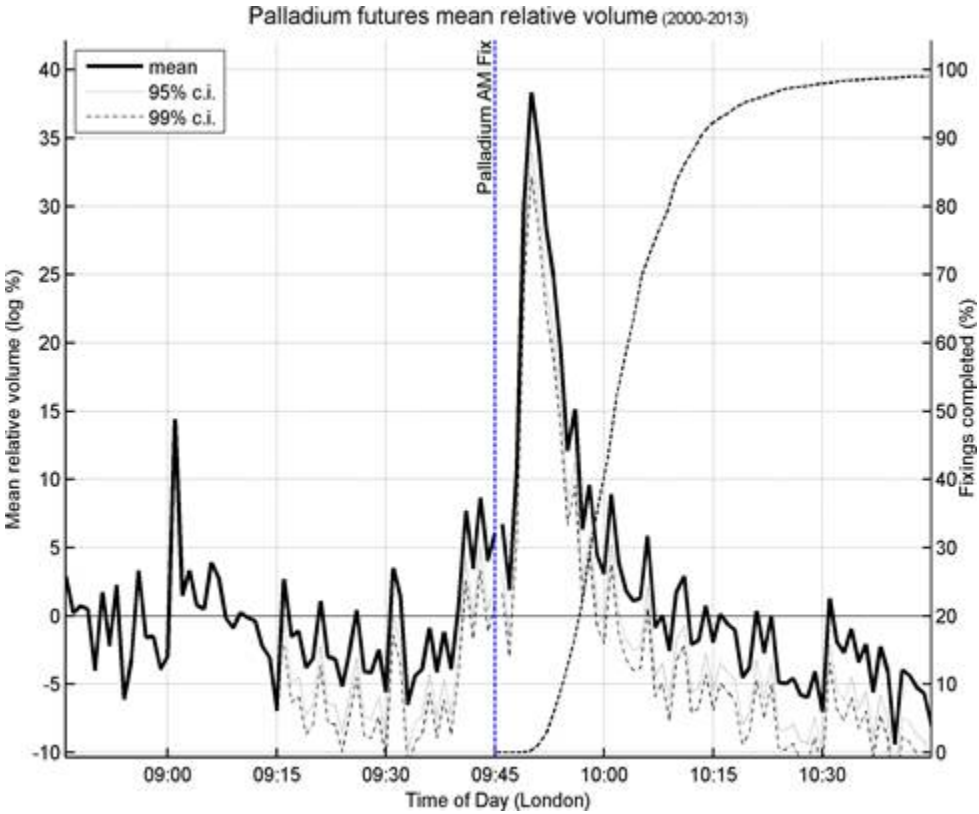
95. NYMEX futures prices have an almost 1 to 1 relationship with the Fixing. This means that if the Fixing is lower by \$1, NYMEX futures prices will also be lower by about \$1 (and vice versa).

96. These relationships make sense: Fix and futures both have a common underlying economic good, be it physical platinum or physical palladium. Any price changes in one instrument are very quickly transmitted and imputed in the other. Arbitrageurs actively monitor and rapidly trade away any price differentials that may momentarily exist, keeping these instruments tightly correlated. It also means that the Defendants could not only use the Fix price to manipulate NYMEX futures prices, but also that NYMEX futures trading could be used to manipulate the Fix price.

97. Further, as shown in the charts below, trade volumes and volatility also increased in Physical and NYMEX Platinum and Palladium around the start times of the Fixing (volume data is unavailable for spot transactions). Indeed, this increase in volume and volatility typically appeared and peaked *during the call*, which means that trading information from the Fixing was having a direct effect on NYMEX Platinum and Palladium prices.

CHARTS 10 to 13

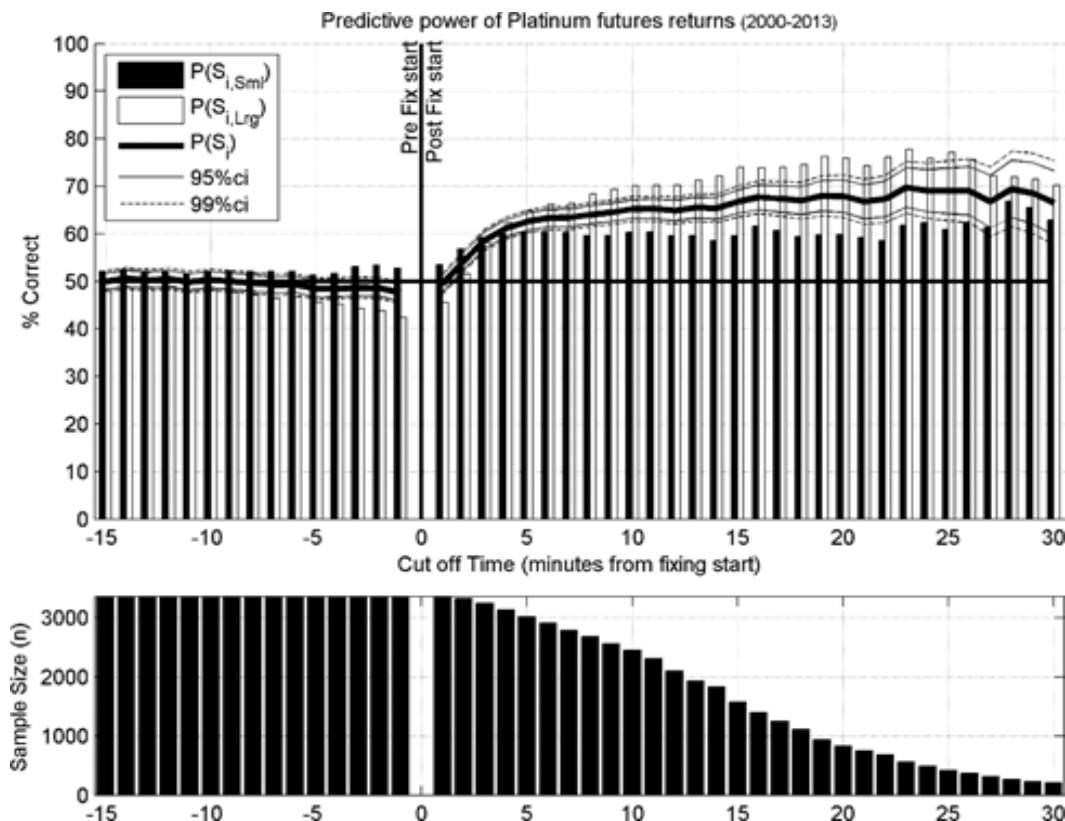


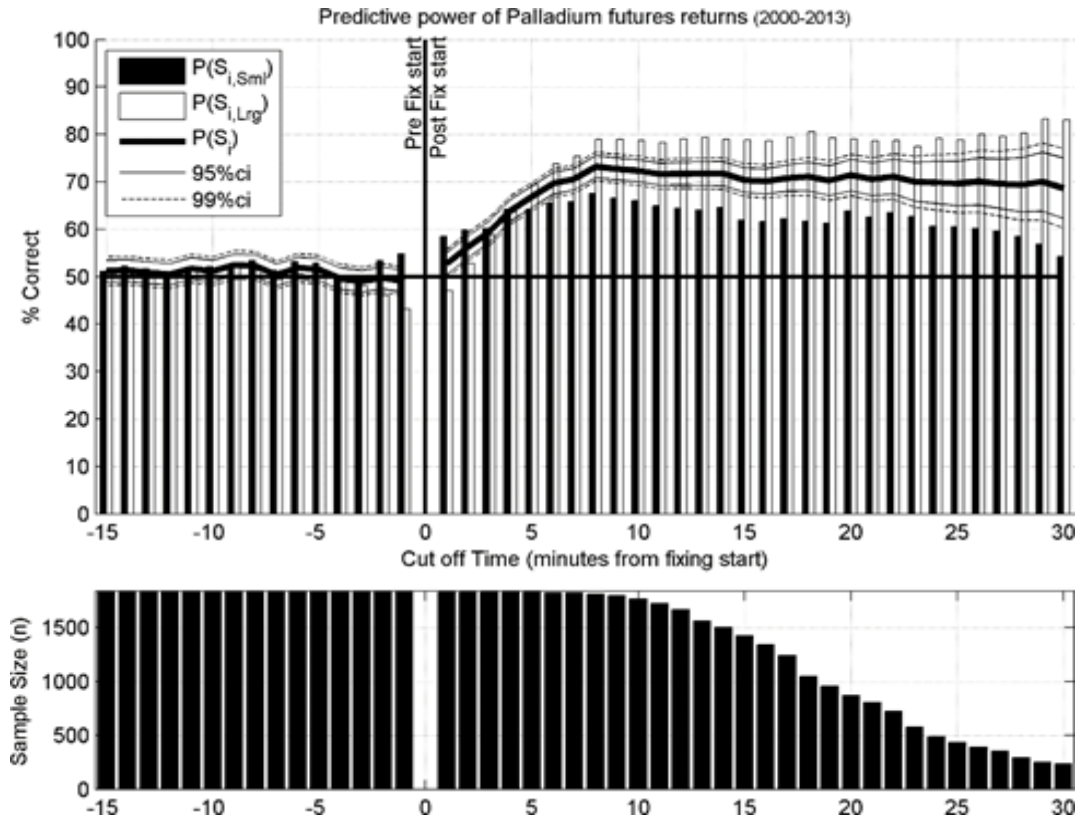


98. The above volume and volatility analysis, which shows that there was increased trading activity in Physical and NYMEX Platinum and Palladium leading up to the conclusion of the Fixing is indicative of Defendants as informed traders, utilizing and trading NYMEX futures on non-public information related to the Fixing (*i.e.*, Defendants were not waiting for the public announcement of the Fix to trade in NYMEX Platinum and Palladium).

99. This is further corroborated by the below analysis showing that significant returns in Physical and NYMEX Platinum and Palladium align to the period before the Fixing result is announced (*i.e.*, returns start to drift in the direction of the Fixing price direction immediately following the Fixing start). Indeed, one can typically predict the ultimate result of the Fix based on the direction of NYMEX Platinum and Palladium during the Fixing window.

CHARTS 14 & 15





100. As shown above, the predictive power of NYMEX futures typically was around 50/50 leading up to the Fix. However, almost immediately after the start of the Fix, NYMEX futures prices exhibit much stronger predictive power to the ultimate outcome of the Fix. Again, this analysis indicates Defendants, who were informed traders, utilizing and trading NYMEX futures based on non-public information related to the Fixing (*i.e.*, Defendants were not waiting for public announcement of the Fix to trade in NYMEX Platinum and Palladium).

101. In efficient markets, price directions resemble a fair coin toss with only a fifty-fifty percent likelihood of success. For platinum and palladiums this is observed in the minutes leading up to the fixing. Once the fixing process starts, prediction rates become statistically significantly higher than a fair coin toss, demonstrating the Fixing's ability to make these markets inefficient, with the inefficiencies creating exploitable profit opportunities for the Defendants. Further, the market appears more inefficient (higher levels of predictability) on

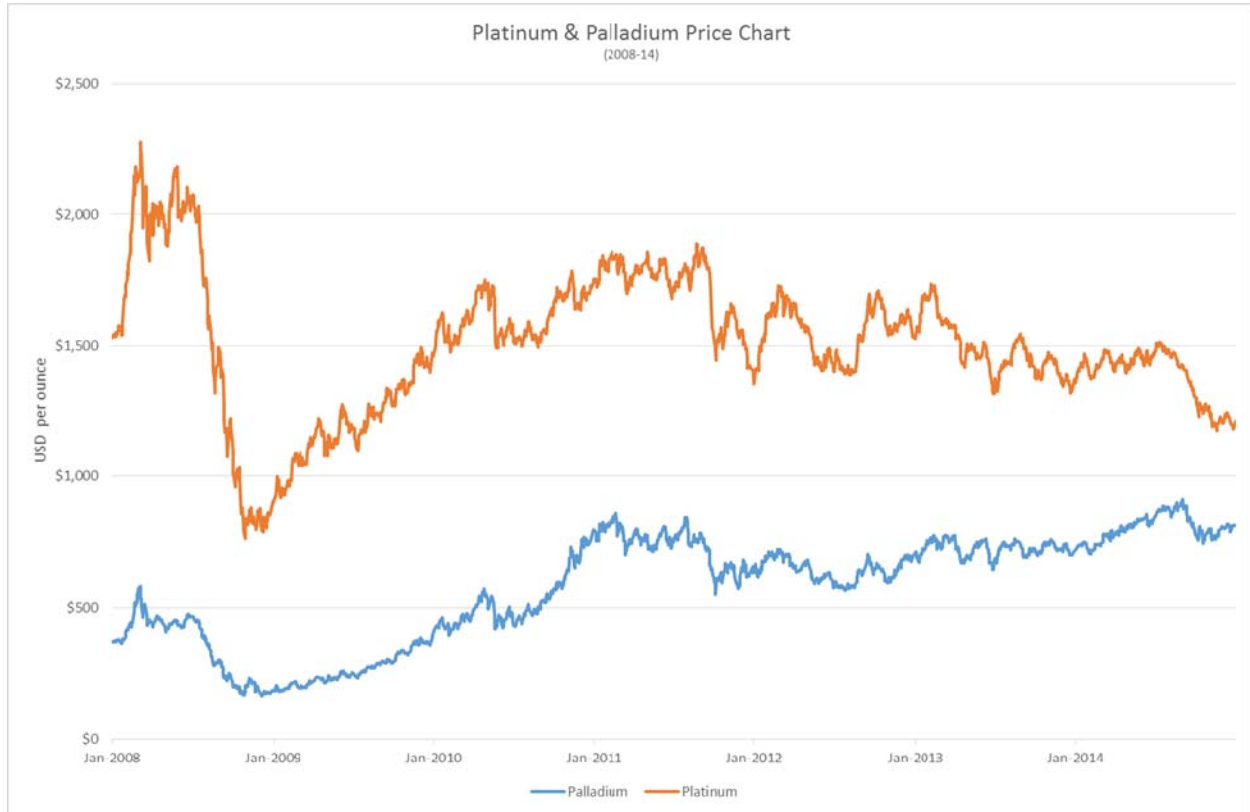
days when there are larger price movements (thus leading to larger trading profits).

102. As expanded on below, the Defendants frequently manipulated the Fixing so that Fix prices would be set at lower levels than competitive market forces would have dictated. This not only caused artificially low prices in the spot market, but also – because of the relationships discussed above – artificially lowered prices for NYMEX Platinum and Palladium. Thus, the Defendants’ suppression of the platinum and palladium Fixing benchmark directly affected the price of Physical and NYMEX Platinum and Palladium, causing the Class to sell these investments at artificially low prices.

103. As noted above, Plaintiffs sold Physical and NYMEX Platinum and Palladium on days that have been identified by Plaintiffs as being days on which the price for platinum and/or palladium was suppressed, in accordance with the methodologies discussed below. They were, thus, like all other Class Members, directly impacted by the Defendants’ manipulation of the market for Physical and NYMEX Platinum and Palladium.

4. Platinum and palladium prices over time

104. As noted above, platinum and palladium are closely related precious metals. As can be seen in the chart below, prices of palladium experienced a decrease at the beginning of the Class Period followed by a general upward trend from 2009 to 2011. After 2011, prices of palladium have traded in more or less the same range from 2011 to 2014. Prices of platinum also experienced a decline from 2008 to 2009, which was followed by a rise from 2009 to 2010, and then a general decline (with periods of ups and downs) between 2010 and 2014.

CHART 16

II. MULTIPLE ECONOMIC ANALYSES REVEAL ARTIFICIAL DOWNWARD SPIKES AROUND THE TIME OF THE FIXING

105. As confirmed by Congressional testimony and academic publications, “screens” are statistical tools based on economic models that use data such as prices, bids, quotes, spreads, market shares, and volumes to identify the existence, causes, and scope of manipulation, collusion, or other illegal behavior. For instance, the use of “screens” was part of the initial analysis that eventually led to the discovery of the LIBOR rate-setting scandal that is still roiling the banking industry. Experts and reporters uncovered anomalous behavior in that interest-rate benchmark as compared to movements in other publically available data points (data points that

were independent of the banks' purported individualized judgment).³¹ Screens also led to the initial detection, in the summer of 2013, of foreign exchange benchmark collusion and manipulation, which resulted in billions of dollars of first round settlement payments by banks in the U.S., the U.K., and Switzerland in November 2014.³²

106. The "screens" developed and employed by Plaintiffs show signs of manipulation occurring within the platinum and palladium market. The data reveals that the price spikes occur far more often around the Fixing than during any other part of the day. The data further reveals that those price spikes are greater in severity than price spikes during other times of the day. And the spikes occurring around the AM and PM Fixing are disproportionately in one direction – down. Further, when prices decrease during the Fix, they almost always decrease by larger magnitudes than when prices increase during the Fix.

107. It is telling that these spikes often begin *before* the official Fixing commences, because it is only the Defendants (and their co-conspirators) working together who could know where the Fix prices would end up. The evidence provided by all of these screens is overwhelming. Prices around the Fixing not only moved abnormally and sharply in one direction, but they acted in a way that is most plausibly explained by the joint manipulative conduct of the entities in charge of the Fixing and their co-conspirators.

108. These spikes are contrary to what economic theory predicts should happen. One would naturally and statistically expect – when a large and diverse set of days over a period of years is studied – the prices during each day's Fixing windows to move up equally as often as

³¹ See generally Testimony of Rosa M. Abrantes-Metz on behalf of the Office of Enforcement Staff, Federal Energy Regulatory Commission (Sept. 22, 2014), *available at* http://elibrary.ferc.gov/idmws/doc_info.asp?document_id=14274590.

³² See Liam Vaughan and Gavin Finch, *Currency Spikes at 4 P.M. in London Provide Rigging Clues*, Bloomberg (Aug. 27, 2013), *available at* www.bloomberg.com/news/2013-08-27/currency-spikes-at-4-p-m-in-london-provide-rigging-clues.html.

down. This is called the “random walk” theory of efficient markets, which states that price movements over a narrow window of time are unpredictable, i.e., prices have a 50-50 chance to move upwards or downwards. This theory was developed by University of Chicago professor and 2013 Nobel laureate Eugene Fama. This theory has long recognized that when measured on a given narrow time frame day to day markets are expected to go up during that narrow time frame approximately as often as they go down.³³

109. The most plausible explanation for the spikes given what is now known is that alleged herein: manipulation. The likelihood that prices not only would randomly spike around the Fix, but also do so in a highly asymmetrical fashion, day after day and year after year, is so improbable as to be non-existent--on the order of less than 0.00001% of the time.

A. The AM and PM Fix Prices Were Often Below the Spot Price at 9:45 a.m. and 2:00 p.m.

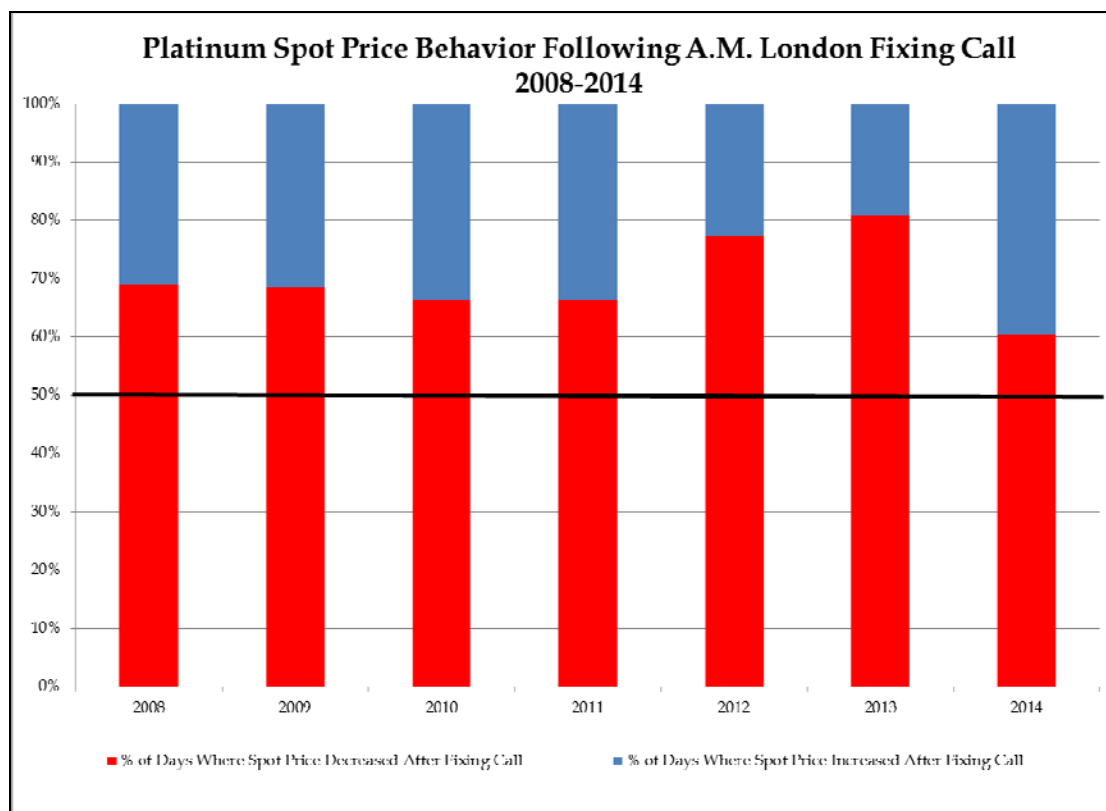
110. One method of uncovering anomalies in the behavior of prices around the time of the Fixing is to chart on how many days the spot price at 9:45 a.m. London Time (the start of the AM Fixing) and 2:00 p.m. London Time (the start of the PM Fixing) were higher than the eventual AM and PM Fix price, however many minutes later the AM and PM Fixing concluded. That is, how often the AM and PM Fixing resulted in a lower spot price.

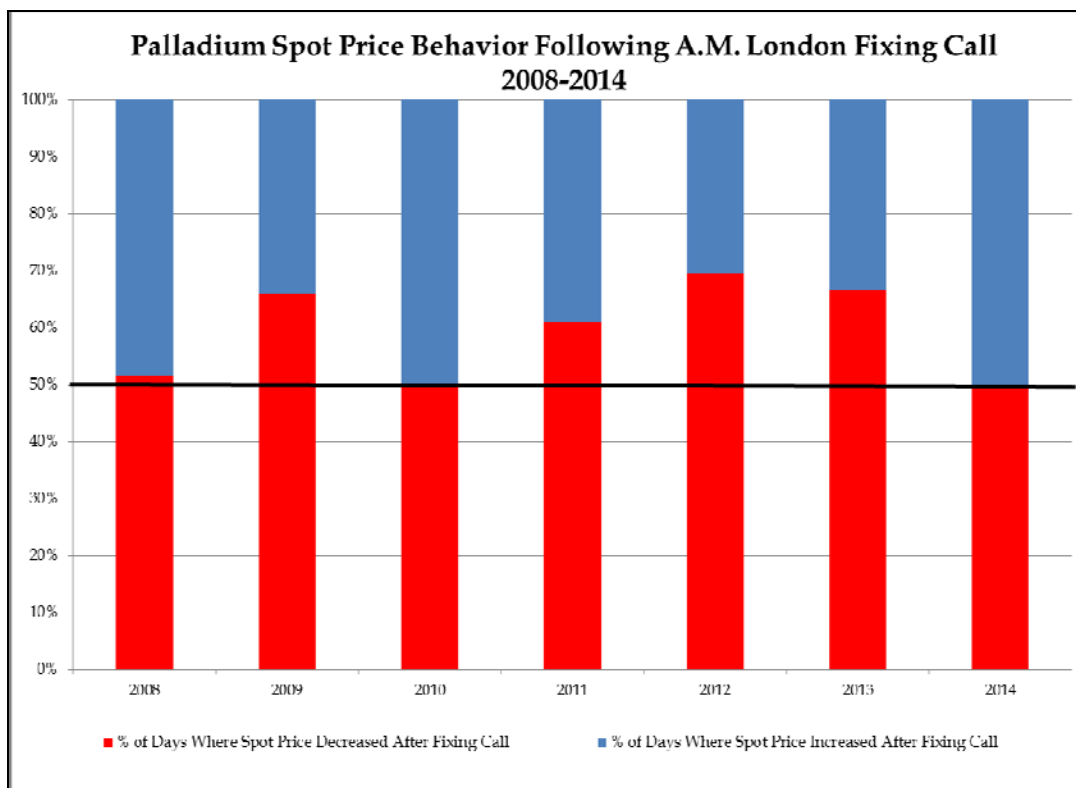
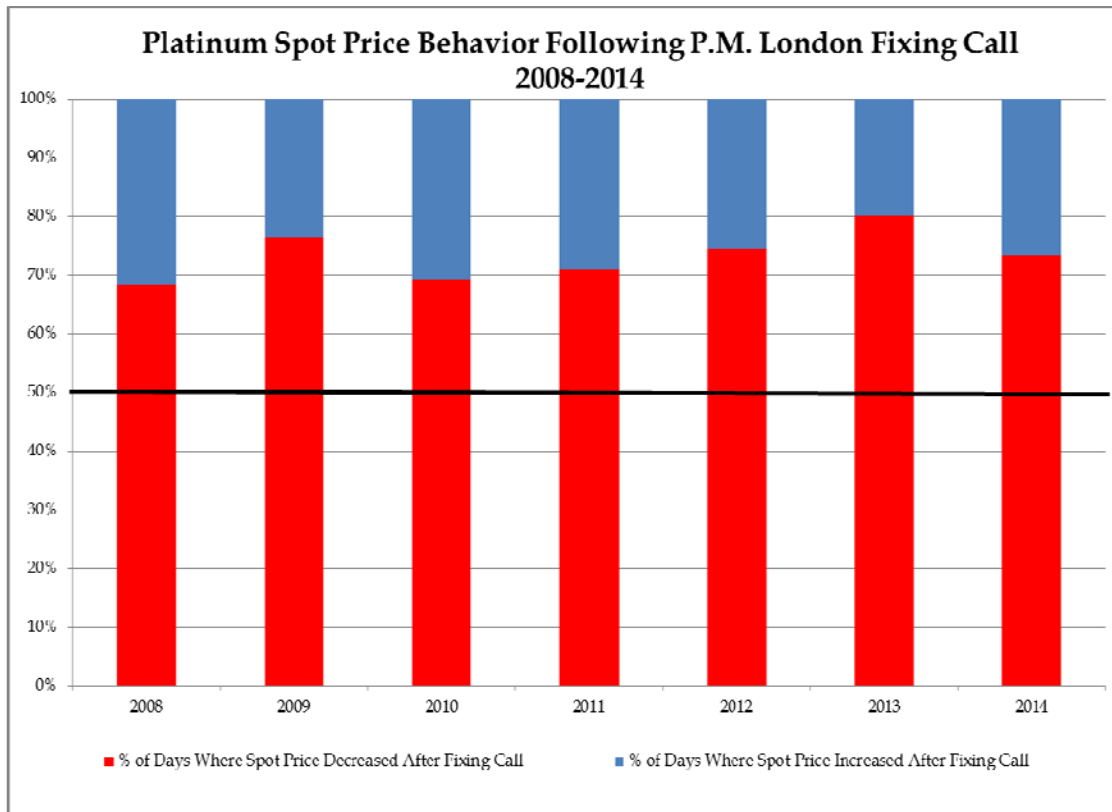
111. Indeed, the opening of the “auction” begins with what is supposed to be the current spot price. While prices can and do move as the Fixing unfolds, there is no reason (absent collusion) that one would expect those prices to move predominantly one way or the other over many repetitions of the Fixing.

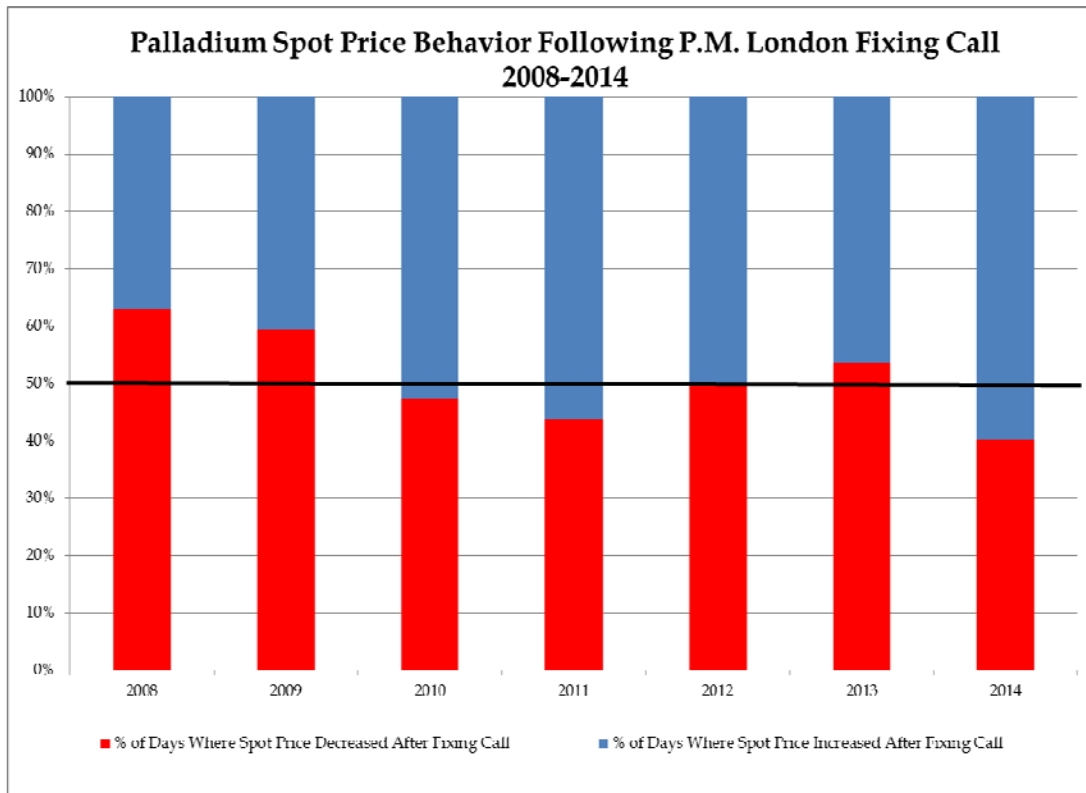
³³ See Eugene Fama, “The Behavior of Stock-Market Prices, *Journal of Business*, Vol. 38, Issue 1 (1965); Eugene Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work,” *Journal of Finance*, Vol. 25 (1970); J.P. Botha, “The Random Walk Model and the Behaviour of Gold Prices: A Note,” *The Investment Analysts Journal*, No. 15 (1980).

112. Thus, one way to determine if prices are behaving abnormally – and whether they are indicative of artificial manipulation – is to compare the percentage of days from 2008 to 2014 during which the price fell during the Fixing window (red in the chart below), compared to the percentage of days in which the price went up during the Fixing window (blue bars).

CHARTS 17 TO 20







113. As can be seen above, for each of seven years platinum prices fell between the start and end of the AM and PM Fixing more often than they rose between the start and end of the AM and PM Fixing. A similar trend can be seen for palladium.³⁴ These results are statistically anomalous, given that it is at least equally likely that prices would move up or down during the Fixing, the number of days on which the price decreased should be about the same as the number of days on which the price increased.

B. Often the AM and PM Fix Prices were Negative Even When the Market was Positive

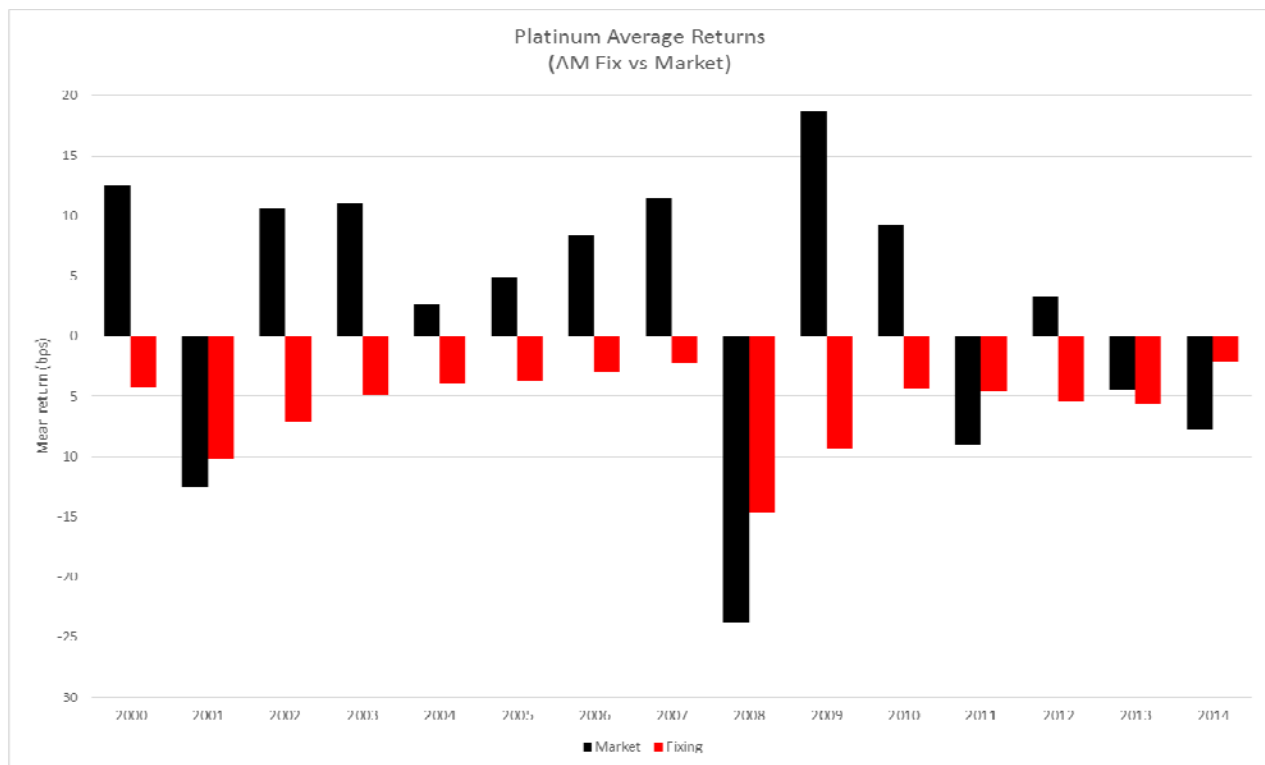
114. Another method of uncovering anomalies in the behavior of prices is to compare how often the Fix was negative compared to the movement of the market as a whole on any

³⁴ Palladium prices were increasing at points during the Class Period. Thus, the depressive effect of Defendants' downward manipulation on prices was tempered by periods of overall increase in palladium price. However, it is unusual that, even though palladium prices were increasing at times during the Class Period, the Fixing was still generally negative for palladium more than 50% of the time.

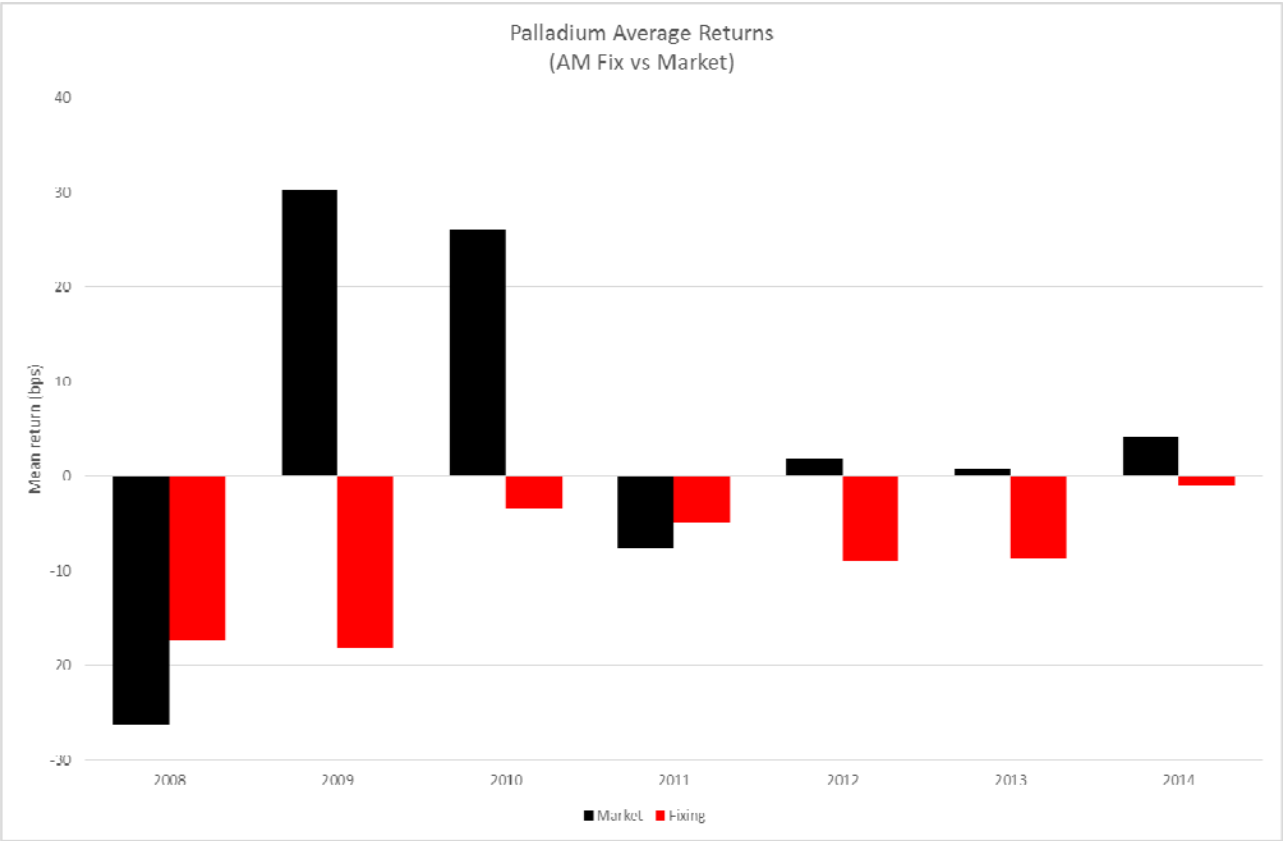
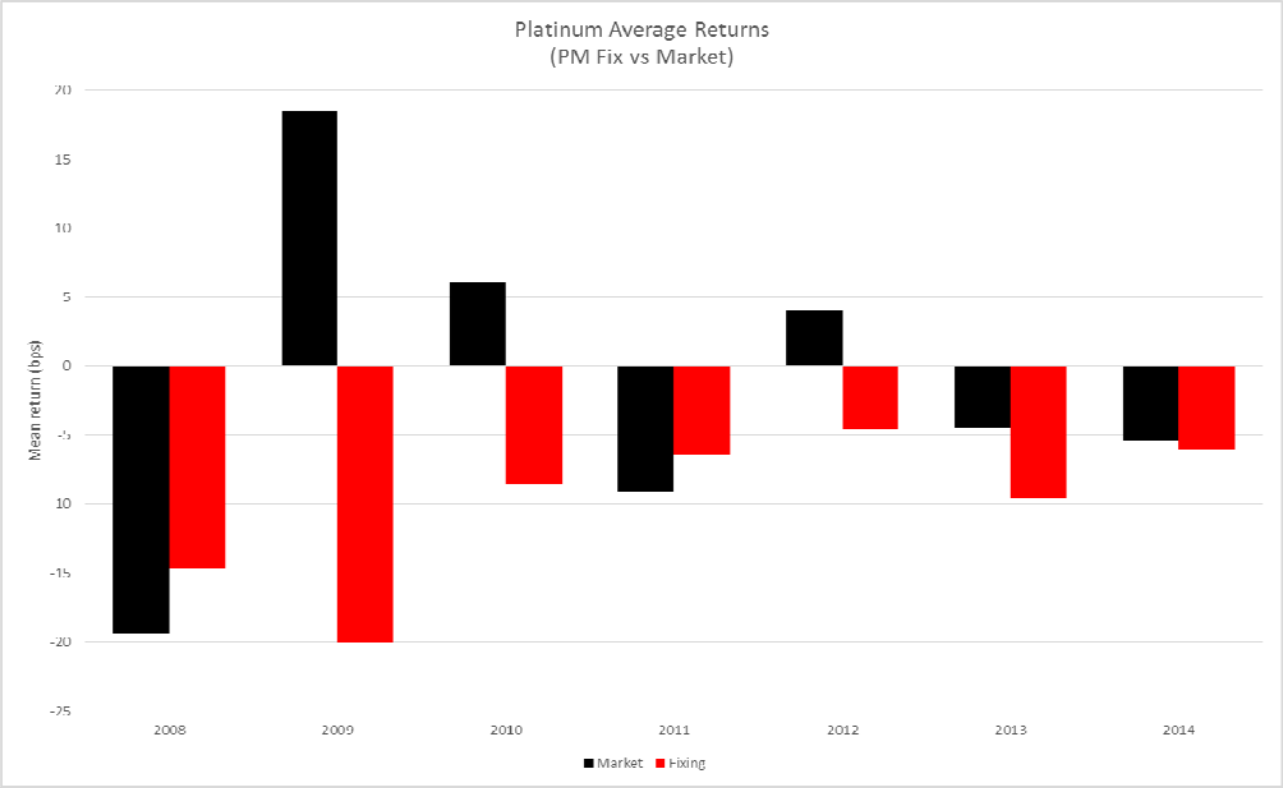
given day. One would naturally expect – when a large and diverse set of days over a period of years is studied – the prices during each day’s fixing window to move up or down largely in sync with the price movement of the market as a whole. While prices during the AM and PM Fixing might occasionally move in the opposite direction of the market as a whole that day, there is no reason (absent collusion) that one would expect AM and PM Fixing prices to *consistently* move against the market.

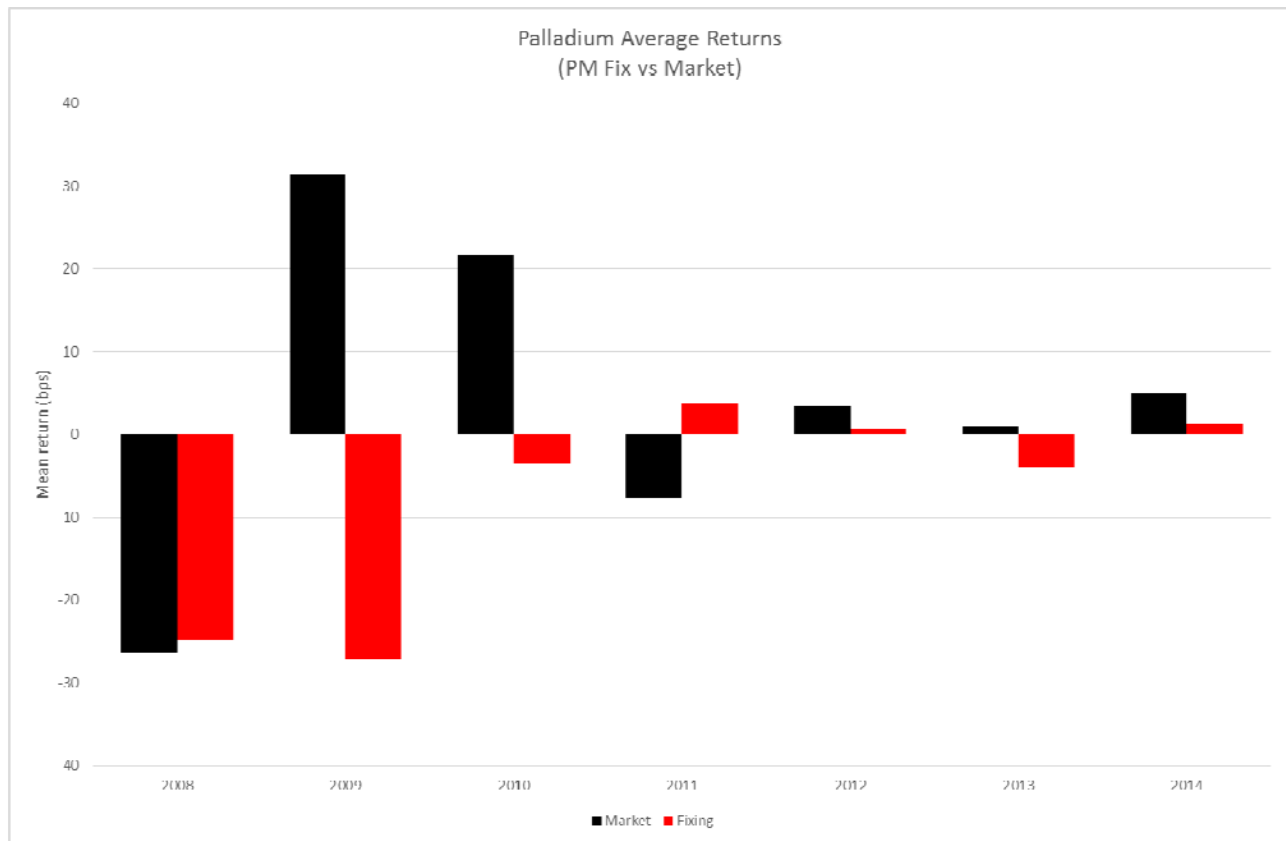
115. Thus, another way to determine if prices are behaving abnormally – and whether they are indicative of artificial manipulation – is to compare the average returns³⁵ during the Fixing (red in the charts below) compared to the average returns for the market as a whole (black in the charts below) from 2008 to 2014.

CHARTS 21 to 24

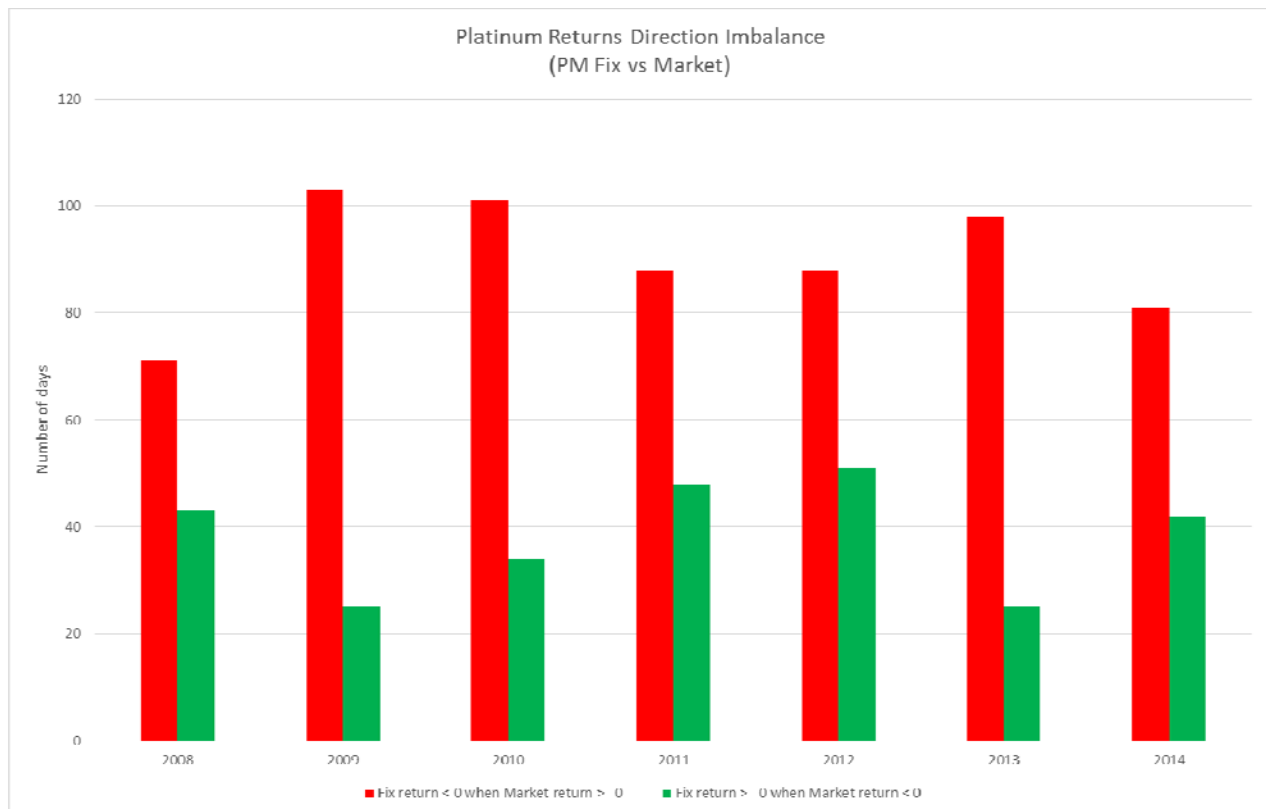
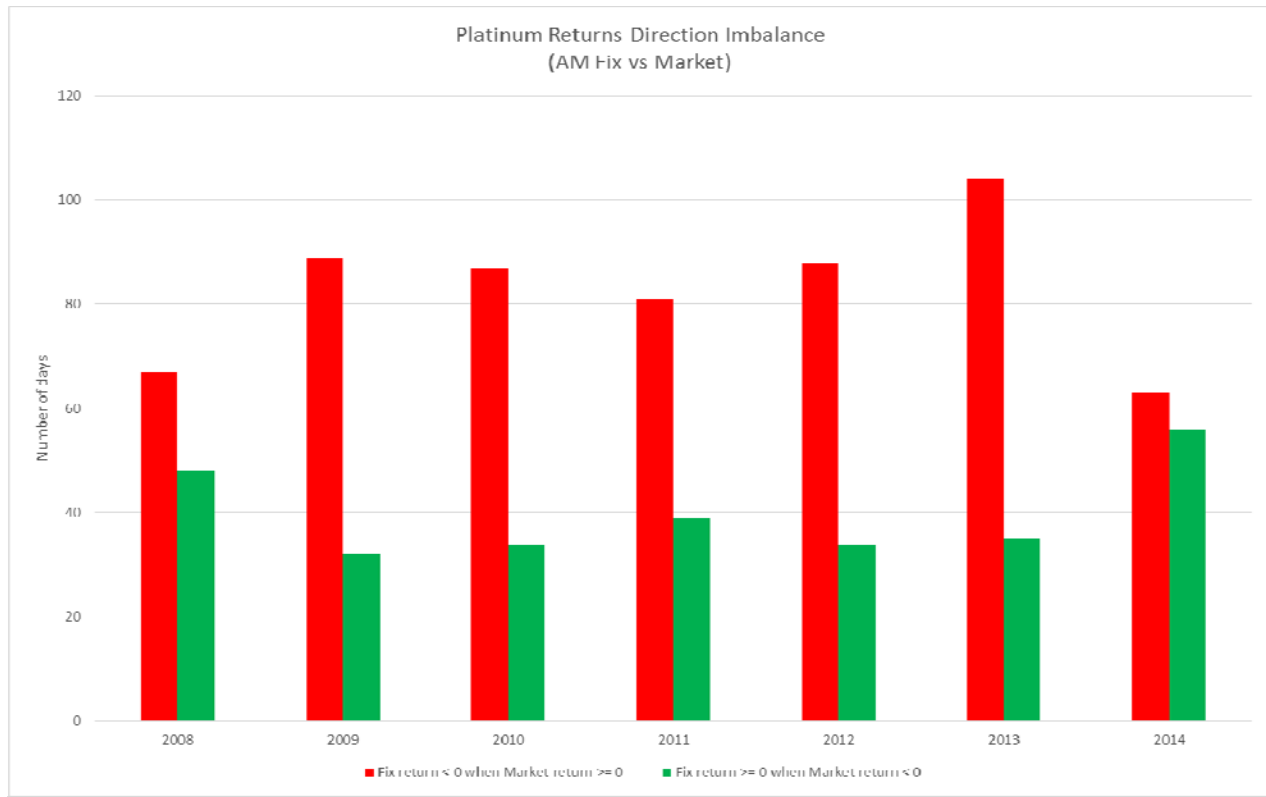


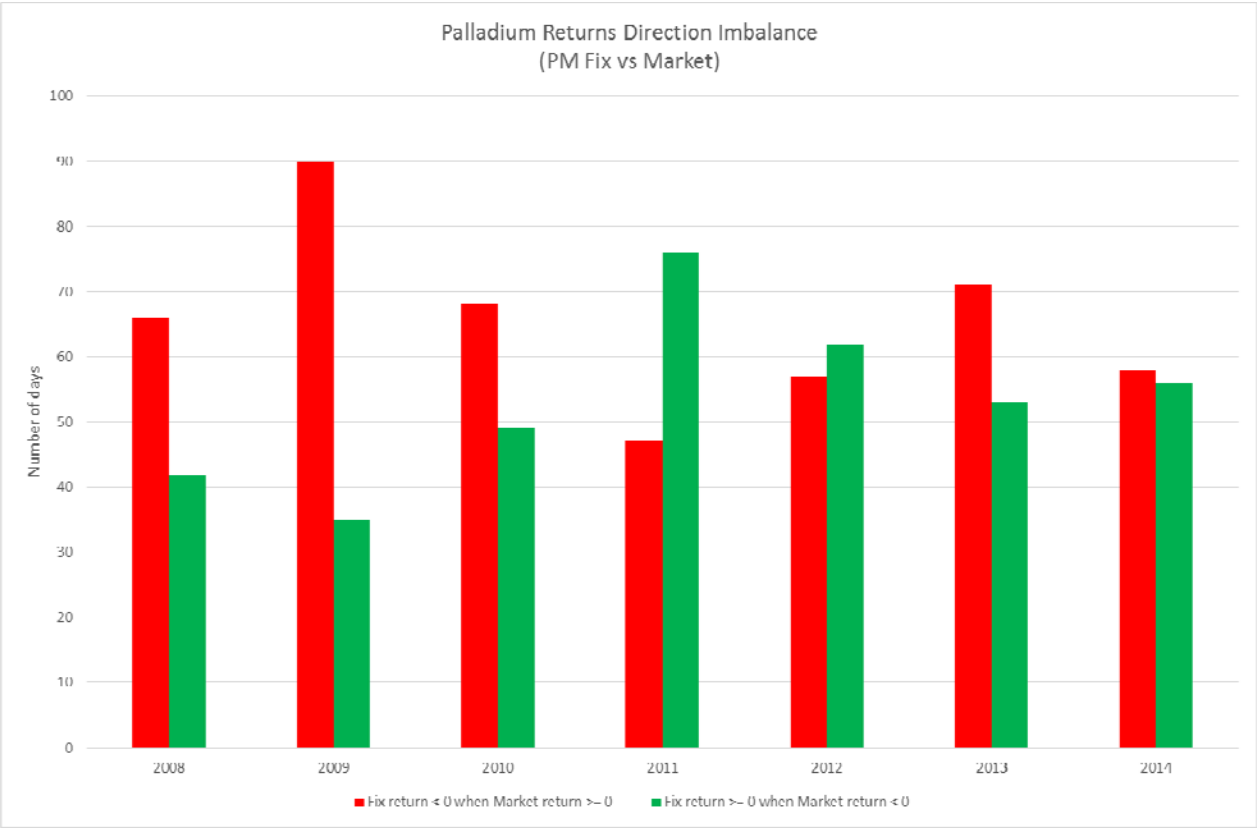
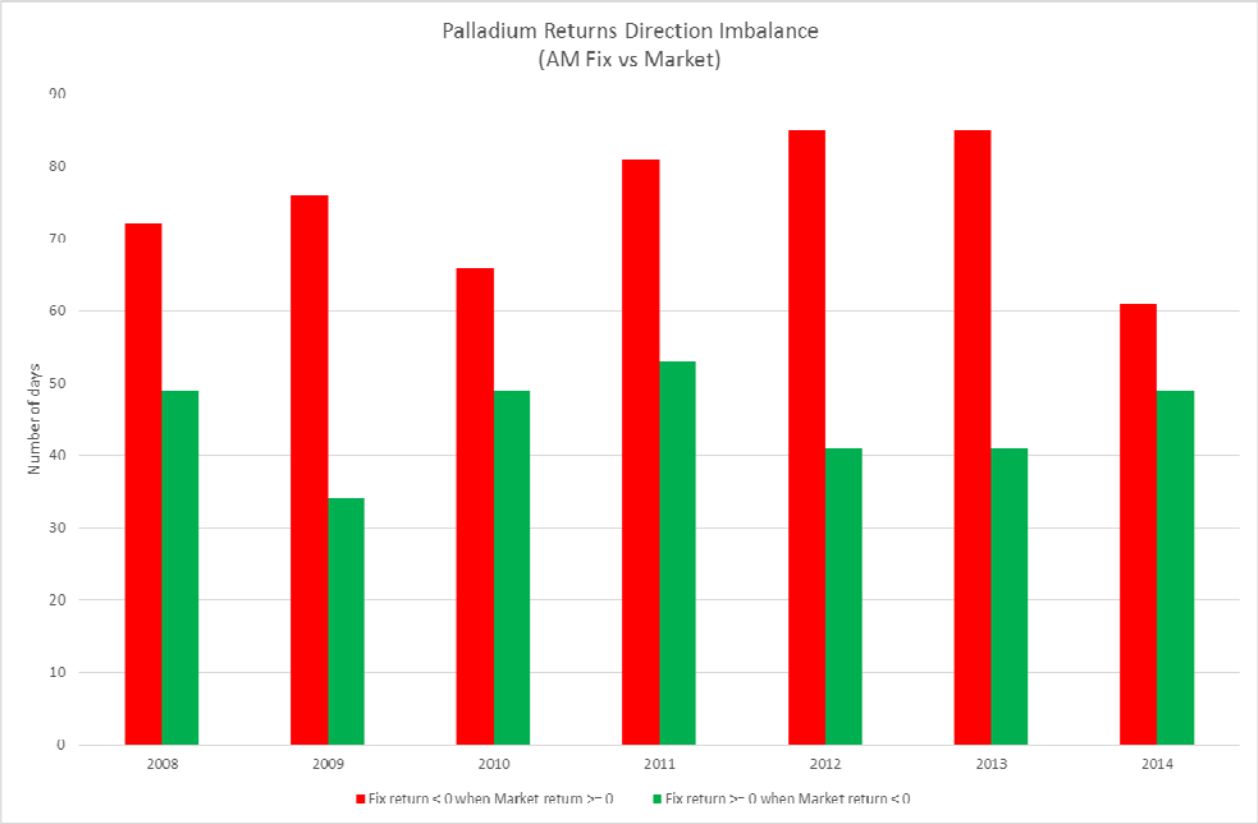
³⁵ Price changes over a specific interval of time are commonly referred to as “returns.” When these returns are looked at over a series of day, weeks, or months and averaged out, they are referred to as “average returns.”





116. Another way of comparing Fix movements to the market as a whole is to look at how the Fix price behaved when the market as a whole was negative or positive that day. As can be seen in the charts below, the Fix price was negative when the overall market was positive (red in the charts below) far more often than the Fix was positive when the overall market was negative (green in the charts below) or, in other words, a direction imbalance compared to the overall market at the Fix. Given the overall market includes the Fix return as part of the day, these charts conservatively underestimate these differences.

CHARTS 25 TO 28



117. As can be seen by the analyses above, for nearly the entire seven year period examined by Plaintiffs, the Fix price had a tendency to fall whether the overall market was positive or negative that day. These results are statistically anomalous, given that one would generally expect price movements during the Fixing to mirror the general trend of the market, the number of days on which the price decreased during the AM and PM Fixing should roughly match the number of days on which price decreased for the market as a whole.

118. Further, the AM and PM Fix consistently being negative defied the “gravity” of the overall market for platinum and palladium by ignoring general trends in platinum and palladium prices. Despite the fact that platinum and palladium went through short-term bull and bear cycles during the Class Period, the negative price movements at the Fix continued throughout the Class Period.

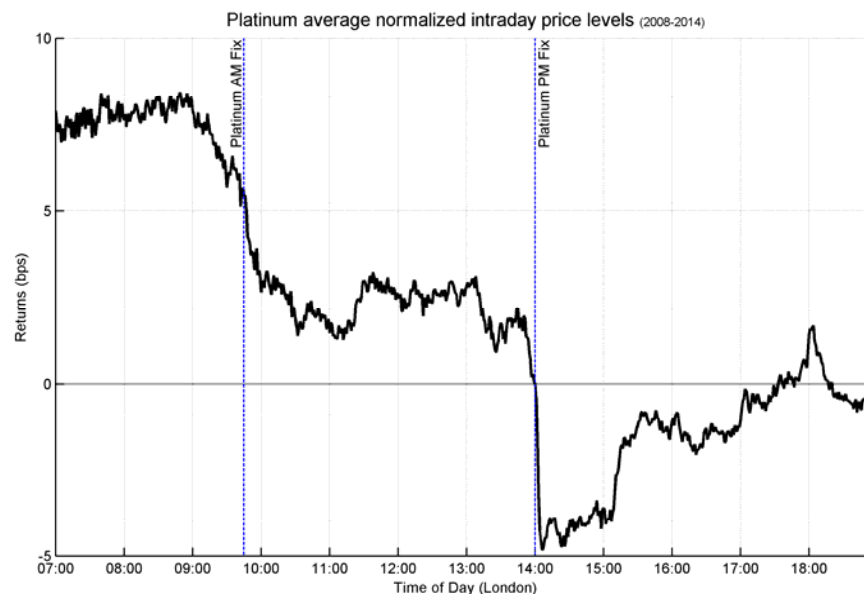
C. A Comparison of Minute-by-Minute Prices Reveal a Pattern of Price Spikes Around the Fixing

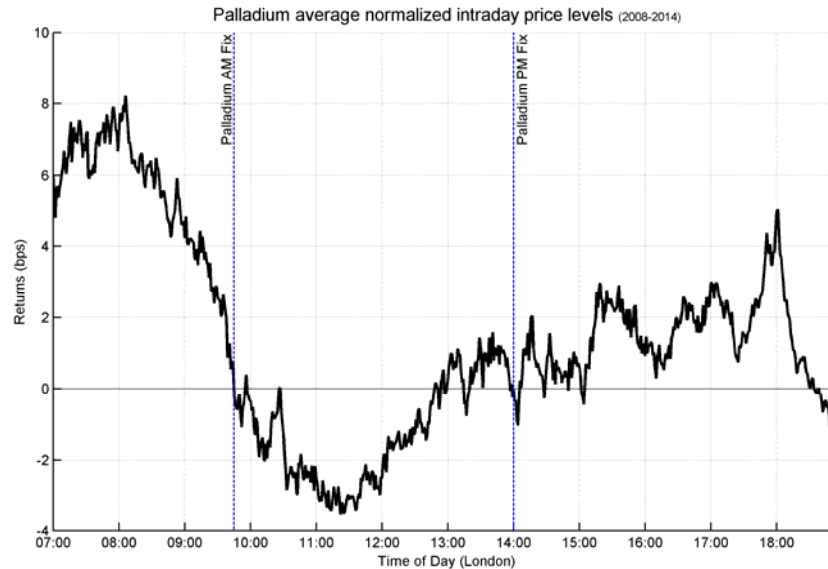
119. Plaintiffs worked with economists to examine closely the available data to determine *how much* unusual behavior could be seen around the AM and PM Fixing, beyond counting the number of days when prices went up or down.

120. Plaintiffs looked at intraday-minute tick data, which shows the upward or downward movement in price from one minute to the next. Prices were normalized by the average price within the same day so that prices within that day can be compared to the next day’s movements, even if the prices are very different in absolute or dollar terms. This is particularly important in platinum and palladium because prices can vary by many dollars from day to day, or month to month, within the same year. Normalization thus enables one to see whether pricing behavior at a particular time of day demonstrates a pattern of abnormal behavior as compared to pricing patterns at other times during the day.

121. The charts below present a clear picture of large price spikes beginning just before the AM and PM Fixing and continuing until about the time the AM and PM Fixing end. These data again show that prices tended to move downward around the AM and PM Fixing. But it also demonstrates the unusual size and intensity of the downward spikes surrounding the AM and PM Fixing. While other times of day see their ups and downs over time, none are as steep as the downward price spikes around the AM and PM Fixing.

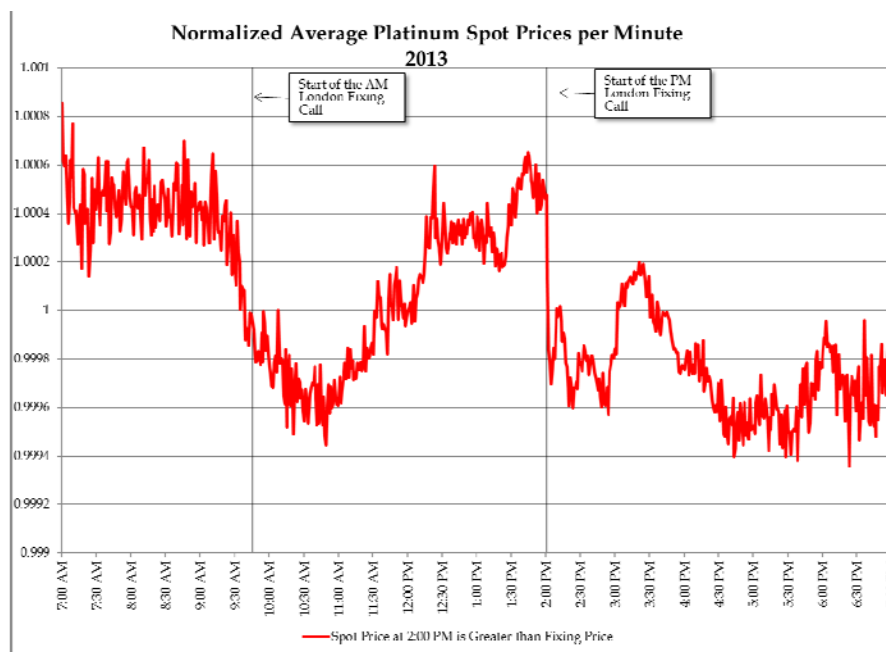
CHARTS 29 & 30

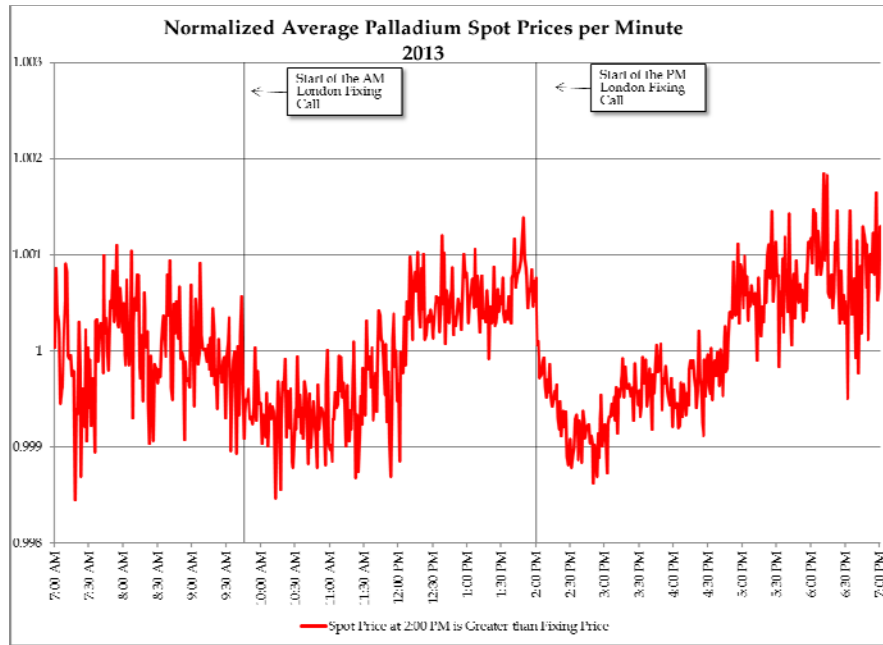




122. These same trends are made even clearer when looking only at the days for which prices decreased during the Fixing calls. For example, the following charts for normalized average platinum and palladium spot prices per minute show that for the whole of 2013 significant downward spikes shortly before the AM and PM Fixing.

CHARTS 30 & 31





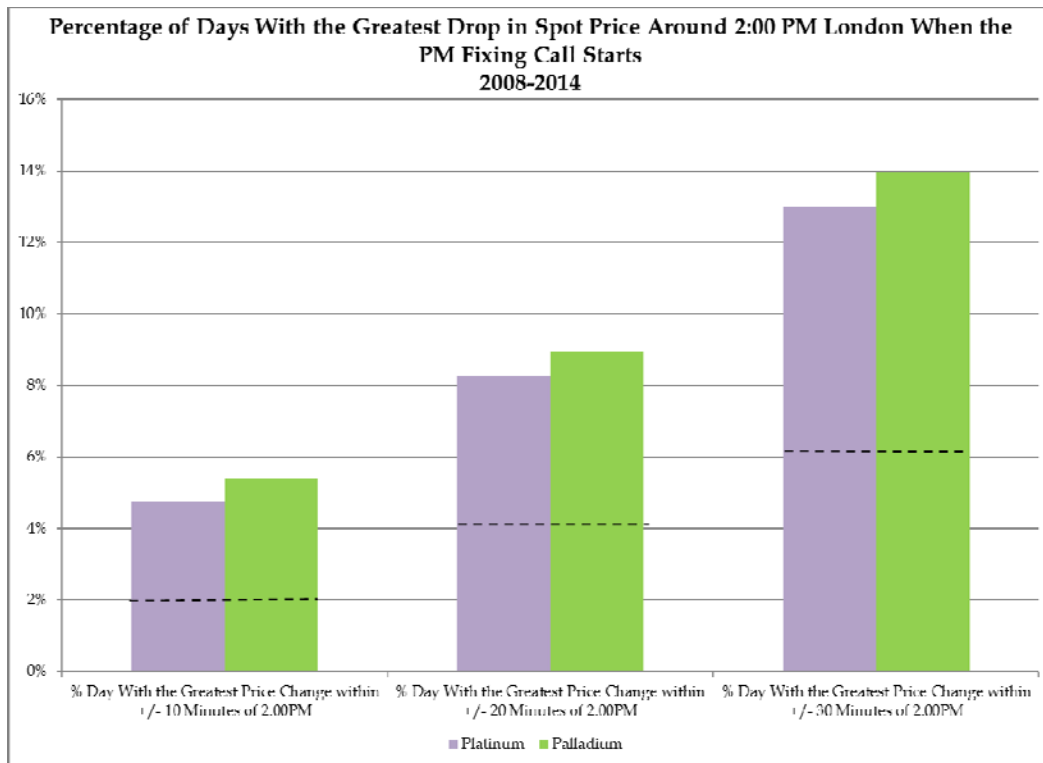
D. The AM and PM Fixing's Downward Spikes Stand Out as Against Movements at Any Other Time of Day

123. Price spikes can occur for any number of reasons. But the point of the above charts – which gather data across an entire year's worth of trading days – is that the largest spike of a day is far more likely to occur around the PM Fixing than any other time of day (with the AM Fixing not far behind). Indeed, as the following charts demonstrate, the incidence of largest downward price spikes of a day within a +/- 10 minute window of the fixing is much larger for platinum and palladium than would be expected if the price changes occurred randomly throughout the day. Plaintiffs identified these “worst minutes” of the day by comparing the price at all minutes with the prices both before and after that minute, and flagging those minutes where the price deviated most from other minutes around it.

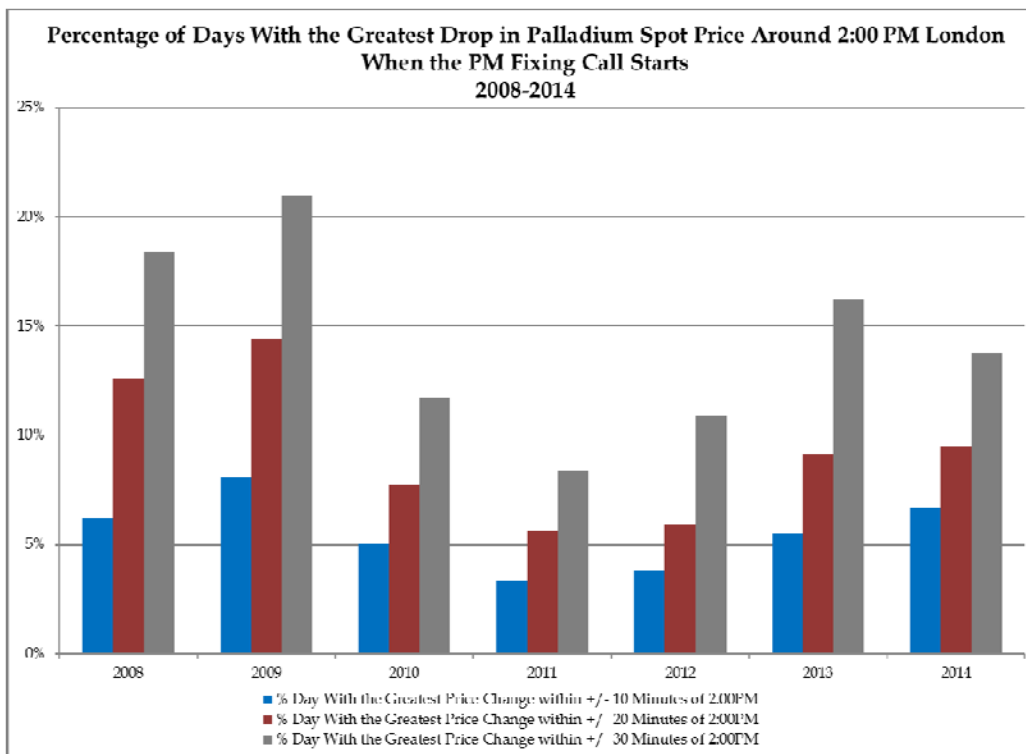
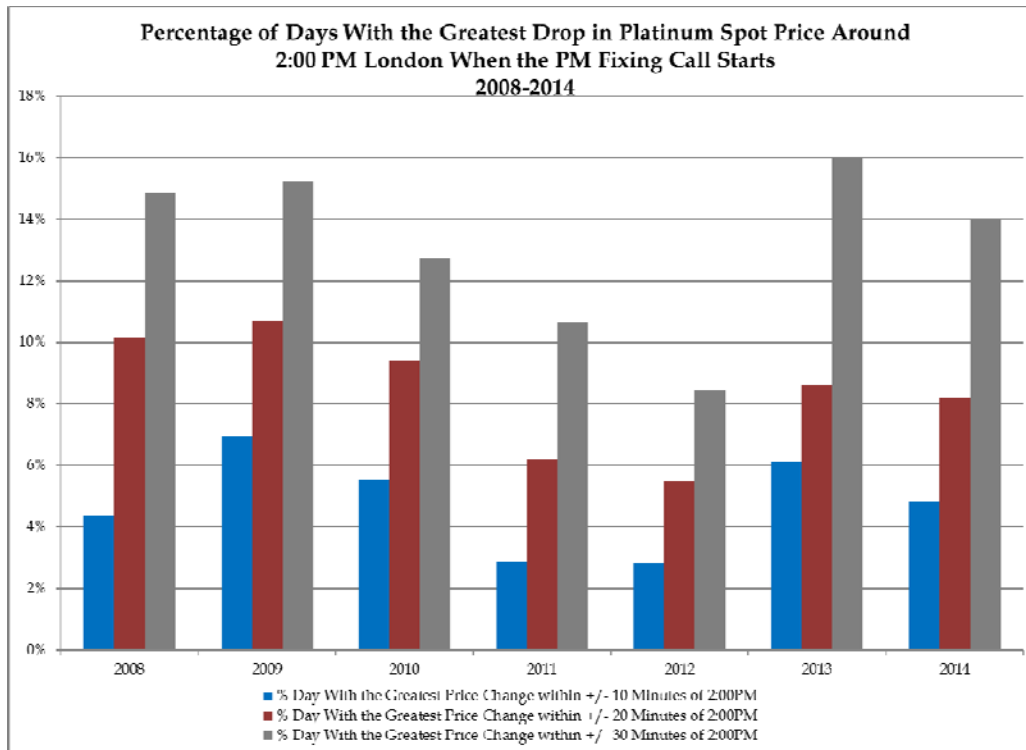
124. During the fifteen hour trading day in the platinum and palladium market, there are 45 different +/- 10 minute windows, just over 22 different +/- 20 minute windows, and 15 different +/- 30 minute windows. The chances of the greatest price change for an entire trading day occurring within the +/- 10 minute, +/- 20 minute, or +/- 30 minute window around the PM

Fixing is accordingly 2.2%, just less than 4.5%, and just less than 6.7%, respectively. Yet, as the below chart shows, the greatest drop in prices for both platinum and palladium occurred during the windows around the PM Fixing far more often than normal statistical probability would suggest (normal statistical probability is represented by the horizontal dashed lines in the below chart).

CHART 32



125. Further, as the following charts demonstrate, the greatest drop in the price of platinum and palladium occurred during the window around the PM Fixing more often than probability would suggest for *every year during the Class Period*.

CHARTS 33 & 34

126. That the largest daily price spikes studied above were anomalous in their clustering around the Fixing is also confirmed by the fact that Plaintiffs measured not just the presence of spikes, but also their *size*.

127. The following charts present analyses tracking the “intensity of price changes” for a sample of years during the Class Period in which the price at each minute is compared to either the price 10 minutes before (lag) or 10 minutes after (lead). Large spikes in behavior around the AM and PM Fixing are revealed that are typically not observed at any other time of day and are statistically anomalous.

128. Whether the lagging or leading prices are used as the comparison point, the largest spike is around the time of the PM Fixing (with the AM Fixing not far behind). This can be seen by spikes in prices that become larger and more negative at 2:00 p.m. London time, as the vertical line at 2:00 p.m. marking the beginning of the call lies almost exactly on top of the largest negative spike by any of the three measures.

CHARTS 35 TO 48

